THE UNIVERSITY OF MINNESOTA

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BULLETIN

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Special Bulletin.

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MINNEAPOLIS, MINN.

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THE UNIVERSITY OF MINNESOTA

CATALOGUE

FOR THE YEAR

1900-1901

AND

ANNOUNCEMENTS

FOR THE YEAR

1901-1902

BY THE UNIVERSITY
MINNEAPOLIS
1901

The University

The University of Minnesota comprises the following named colleges, schools and departments:
The Graduate Department.
The College of Science, Literature and the Arts.
    The School of Technical and Applied Chemistry.
The College of Engineering and the Mechanic Arts.
The School of Mines.
The College of Agriculture.
    The School of Agriculture.
    The Dairy School.
The College of Law.
The Department of Medicine, composed of colleges as follows:
    The College of Medicine and Surgery.
    The College of Homeopathic Medicine and Surgery.
    The College of Dentistry.
    The College of Pharmacy.
The Regents of the University have also entrusted to their charge
    The Experiment Station;
    The Geological and Natural History Survey.

The Graduate Department. In each of the colleges, except that of medicine, there are advanced courses of study leading to second degrees. These courses are open to graduates of any reputable college upon presentation of diploma.

In the College of Science, Literature and the Arts there are four four-year courses of study, the classical, scientific, literary and civic. The classical course offers for its leading studies the Greek and Latin languages; the scientific course, the natural and physical sciences; the literary course, the modern languages; the civic course, history and economics. The completion of the courses leads respectively to the degrees: bachelor of arts, bachelor of science, bachelor of literature, and bachelor of philosophy. The advanced degrees offered in this college are: master of arts, science, literature and philosophy, and doctor of philosophy.

The School of Technical and Applied Chemistry, leading to the degree of bachelor of science, is also organized as a part of this college.

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A Summer School for Teachers. A four weeks' course of instruction is offered, in various University subjects, for those whose school duties prevent them from taking the regular University courses.

THE COLLEGE OF ENGINEERING AND THE MECHANIC ARTS offers courses of study, of four years each, in civil, mechanical and electrical engineering; leading to the degrees of civil, mechanical and electrical engineer. This college offers a four years' course of study in science and technology leading to the degree of bachelor of science, with an additional year leading to the engineer's degree in the various lines offered in the college. This college also offers graduate work leading to the degree master of science.

THE SCHOOL OF MINES offers a four years' course of study in mining and metallurgy; upon the completion of which the degrees engineer of mines and metallurgical engineer are conferred.

THE COLLEGE OF AGRICULTURE offers a regular course in agriculture of four years college work; the degree of bachelor of agriculture is conferred on completion of the course.

THE SCHOOL OF AGRICULTURE is open to both men and women, and is a training school for practical farm life and in domestic economy. The college of agriculture is open to graduates of this school.

A Dairy School offers practical instruction in dairying to those who have had some experience in conducting a dairy.

THE COLLEGE OF LAW offers a three years' course of instruction, leading to the degree of bachelor of laws. There is an evening class in this college leading to the same degree. This college offers graduate work leading to the degrees, master of laws, and doctor of civil law.

THE COLLEGE OF MEDICINE AND SURGERY and THE COLLEGE OF HOMEOPATHIC MEDICINE AND SURGERY each offers a four years' course of study, of eight and one-half months each. Upon completion of the prescribed course the degree, doctor of medicine is conferred.

THE COLLEGE OF DENTISTRY offers a three years' course of study of nine months each; upon completion of the prescribed course the degree of doctor of dental medicine is conferred.

THE COLLEGE OF PHARMACY offers a two or three years' course of study, leading to the degree of pharmaceutical chemist. This college also offers graduate work leading to the degrees, master of pharmacy, and doctor of pharmacy.

SPECIAL COURSES. In each of the colleges, students, of an advanced age and adequate preparation, are permitted to pursue, under the direction of the faculty, one or two distinct lines of study.

Bulletins of any department sent free to any address, upon application. The full catalogue will be sent only upon receipt of ten cents to cover postage. Address, THE REGISTRAR,

University of Minnesota,
Minneapolis, Minn.

Organization.

The University was originally organized in 1851; it was re-organized in 1860, 1864 and 1868, and dates its actual beginning from the last named year.

The University is organized under the following act:

AN ACT to re-organize and provide for the Government and regulation of the University of Minnesota, and to establish an Agricultural College therein.

As amended by Chapter X of the General Laws of 1872:

AN ACT to amend Chapter I of the Session Laws of 1868, relating to the University of Minnesota.

Section 1. The object of the University of Minnesota, established by the Constitution at or near the Falls of St. Anthony, shall be to provide the means of acquiring a thorough knowledge of the various branches of literature, science and the arts, and such branches of learning as are related to agriculture and the mechanic arts, including military tactics and other scientific and classical studies.

Sec. 2. There shall be established in the University of Minnesota five or more colleges or departments, that is to say, a College of Science, Literature and the Arts, a College of Agriculture, including "military tactics," a College of the Mechanic Arts, a College or Department of Law, and also a College or Department of Medicine. The Department of Elementary Instruction may be dispensed with at such a rate and in such wise as may seem just and proper to the Board of Regents.

Sec. 3. The government of the University shall be vested in a board of ten Regents, of which the Governor of the State, the State Superintendent of Public Instruction, and the President of the University, shall be members *ex-officiis*, and the remaining seven members thereof shall be appointed by the Governor, by and with the advice and consent of the Senate. Whenever a vacancy occurs therein, for any cause, the same shall be filled for the unexpired term in the same manner. Of the Regents thus appointed, two shall be commissioned and hold their offices for one year, and two for two years, and three for three years. Their successors shall be appointed in like manner, and shall hold their offices for the full term of three years from the first Wednesday of March succeeding their appointments, and until their successors are appointed and qualified. The President of the University shall have the same rights, powers and privileges as other members, *except the right of voting, and shall be, *ex-officio*, the Corresponding Secretary of the Board of Regents.

Sec. 4. The Regents of the University shall constitute a body corporate, under the name and style of "The University of Minnesota;" and by that name may sue and be sued, contract and be contracted with, make and use a common seal and alter the same at pleasure; a majority of the voting members shall constitute a quorum for the transaction of business, and a less number may adjourn from time to time.

Sec. 5. The Board of Regents shall elect from the members of the Board a President of the Board, [a] Recording Secretary and [a] Treasurer, who shall hold their respective offices during the pleasure of the Board. And the President and Treasurer each before entering upon the duties of his office, shall execute a bond in the penal sum of fifty thousand dollars, with at least two sufficient sureties, to the State of Minnesota, to be approved by the Governor, conditioned for the faithful and honest performance of the duties of his office according to law, which bonds, when so approved, shall be filed at the office of the Secretary of State.

Sec. 6. The Board of Regents shall have the power, and it shall be their duty, to enact by-laws for the government of the University of Minnesota in all its departments; to elect a President of the University, and, in their discretion, a Vice-President, and the requisite number of professors, instructors, officers and employes, and to fix their salaries, [and] also the term of office of each, and to determine the moral and educational qualifications of applicants for admission, and in the appointment of professors, instructors and other officers, and assistants of the University, and in prescribing the studies and exercises thereof; and, in all the management and government thereof, no partialty or preference shall be shown to one sect or religious denomination over another; nor shall anything sectarian be taught therein. And the Board of Regents shall have the power to regulate the course of instruction, and [to] prescribe the books and authorities to be used, and also to confer such degrees and grant such diplomas as is usual, in their discretion. It shall be the duty of the Recording Secretary to record all the proceedings of the Board, and carefully preserve all its books and papers; and before entering upon the duties of his office he shall take and subscribe an oath to perform his duties honestly and faithfully as such officer. It shall be the duty of the

*By the later act the President has been given a vote.

Treasurer to keep an exact and faithful account of all moneys, bills receivable and evidence of indebtedness, and all securities of property received or paid out by him, and before entering upon his duties shall take and subscribe an oath that he will well and faithfully perform the duties of Treasurer thereof. It shall be the duty of the President to preside at the meetings of the Board; and in case of his inability to preside, the Board may appoint a President *pro tempore.*

Sec. 7. In addition to all the rights, immunities, franchises and endowments heretofore granted or conferred upon the University of Minnesota, for the endowment, support and maintenance thereof, there shall be and is hereby inviolably appropriated and placed at the disposal of the Board of Regents thereof, to be drawn from the State treasury upon the order of the President, drawn upon the State Auditor, countersigned by the Secretary of the Board and payable to the order of the Treasurer of the Board, all the interest and income of the fund to be derived from the sale of all lands granted and to be granted to the State of Minnesota by virtue of an act of Congress, entitled ‘An act donating lands to the several States and Territories which may provide colleges for the benefit of agriculture and the mechanic arts," approved July 2d, 1867; and also all such gifts, grants and contributions to the endowment thereof as may be derived from any and all such sources.

Sec. 8. And in order to effect a settlement of all remaining indebtedness of the University, all the powers and authorities given by Chapter 18 of the laws of 1864, entitled "An act relating to the University of Minnesota," and Chapter 11 of the laws of 1866, entitled "An act to amend an act relating to the University of Minnesota, approved March 4, 1864," to the Regents therein mentioned, are hereby given to and conferred upon the Board of Regents of the University of Minnesota aforesaid, and the said acts are hereby continued and shall be in force until such outstanding indebtedness is fully liquidated,

Sec. 9. The first meeting of the first Board of Regents under the provisions of this act, shall be holden at the University building on the first Wednesday in March, 1868, at which meeting the officers of the Board shall be elected, and the annual meetings of the Board shall be holden on the second Tuesday in December in each and every year thereafter.

Sec. 10, Any person or persons contributing a sum of not less than fifteen thousand dollars shall have the privilege of endowing a professorship in the University, the name and object of which shall be designated by the Board of Regents.

Sec. 11. The said Board of Regents shall succeed to and have control of the books. records, building and all other property of the University; and the present Board of Regents shall be dissolved immediately upon the organization of the Board herein provided for: *Provided*, that all contracts made and at that time, binding upon the Board then dissolved, shall be assumed and discharged by their successors in office.

Sec. 12. It shall be the duty of the Board of Regents herein provided for, to make arrangements for securing suitable lands, pursuant to the act of Congress, above mentioned, in the vicinity of the University, for an experimental farm; and as soon thereafter as may be to make such improvements thereon as will render the same available for experimental purposes in connection with the course in the agricultural college; and for such purpose the Board of Regents is hereby authorized to expend a sum not exceeding the amount specified by the act of Congress aforesaid.

Sec. 13. On or before the second Tuesday in December in each and every year, the Board of Regents, through their President, shall make a report to the Governor, showing in detail the progress and condition of the University during the previous University year, the wants of the institution in all its various departments—the nature, costs and results of all improvements, experiments and investigations, the number of professors and students—the amounts of money received and disbursed—and such other matters, including industrial and economic statistics, as they deem important or useful. One copy of said report shall be transmitted to each of the other colleges endowed under the provisions of the said act of Congress, and one copy to the Secretary of the Interior.

Sec. 14. The President of the University shall be the President of the general faculty and of the special faculties of the several departments or colleges, and the executive head of the institution in all its departments. As such officer, he shall have authority, subject to the Board of Regents, to give general direction to the practical affairs and scientific investigations of the University, and in the recess of the Board of Regents to remove any employe or subordinate officer not a member of the faculty. and supply for the time being any vacancies thus created. He shall perform the customary duties of a corresponding secretary, and may be charged with the duties of one of the professorships. He shall make to the Superintendent of Public Instruction, on or before the second Tuesday in December in each and every year, a report, showing in detail the progress and condition of the University during the previous University year—the number of professors and students in the several departments—and such other matters relating to the proper educational work of the institution as he shall deem useful, It shall be the duty of the President of the University to make to the Board of Regents, on or before the second Tuesday in December in each and every year, a report showing in detail the progress and condition of the University during the previous University year—the nature and results of all important experiments and investigations, and such other matters, including economic and industrial facts and statistics as he shall deem useful.

Sec. 15. Chapter eighty of the laws of eighteen hundred and sixty, chapter eighty-seven of the laws of eighteen hundred and sixty-two, and so much and such parts of any and all acts and laws, whether general or special, as are inconsistent with the provisions of this act, are hereby repealed.

Sec. 16. This act shall take effect and be in force from and after its passage.

Approved February 18, 1868. Act to amend approved February 29, 1872.

Board of Regents

The HON. JOHN S. PILLSBURY, Minneapolis,	*Regent for Life*
CYRUS NORTHROP, LL. D., Minneapolis, The President of the University.	*Ex-Officio*
The HON. SAMUEL R. VAN SANT, Winona, The Governor of the State.	*Ex-Officio*
The HON. JOHN W. OLSON, Albert Lea, The State Superintendent of Public Instruction.	*Ex-Officio*
The HON. ELMER E. ADAMS, B. A., Fergus Falls,	1902
The HON. THOMAS WILSON, St. Paul,	1903
The HON. WILLIAM M. LIGGETT, Benson,	1903
The HON. A. E. RICE, Willmar,	1903
The HON. GREENLEAF CLARK, M. A., St. Paul,	1904
The HON. SAMUEL G. SMITH, Ph. D., LL. D., St. Paul,	1904
The HON. STEPHEN MAHONEY, B. A., Minneapolis,	1907
The HON. O. C. STRICKLER, M. D., New Ulm,	1907
The HON. JAMES T. WYMAN, Minneapolis,	1907

OFFICERS

The HON. JOHN S. PILLSBURY, *President.*

PRESIDENT CYRUS NORTHROP, LL. D., *Corresponding Secretary.*

STEPHEN MAHONEY, B. A., *Recording Secretary.*

ST. ANTHONY FALLS BANK, *Treasurer.*

Executive Officers

THE UNIVERSITY

Cyrus Northrop, LL. D., *President.*
E. Bird Johnson, B. S., *Registrar.*
D. W. Sprague, *Accountant.*

THE COLLEGES

William M. Liggett, *Dean of Department of Agriculture.*
William S. Pattee, LL. D., *Dean of the College of Law.*
Parks Ritchie, M. D., *Dean of the College of Medicine and Surgery.*
Alonzo P. Williamson, M. D., *Dean of the College of Homeopathic Medicine and Surgery.*
William P. Dickinson, D. D. S., *Dean of the College of Dentistry.*
Frederick J. Wulling, Ph. G., *Dean of the College of Pharmacy.*
William R. Appleby, M. A., *Dean of the School of Mines.*
Frederick D. Tucker, B. A., *Principal of the School of Agriculture.*

LIBRARY AND MUSEUM

William Watts Folwell, LL. D., *Librarian.*
  Lettie M. Crafts, B. L., *Assistant Librarian.*
  Ina Firkins, B. L., *Library Assistant.*
  Anna L. Guthrie, B. A., *Library Assistant.*
  Ruth Eddy Keyes, B. A., *Librarian of School of Agriculture.*
  Edith Bowen, *Librarian of Department of Medicine.*
  William Furst, B. S., *Librarian of the College of Law.*
Christopher W. Hall, M. A., *Assistant Curator, Geological Museum.*
Henry F. Nachtrieb, B. S., *Curator of the Zoological Museum.*

Allen W. Guild, *Superintendent of Buildings.*

CALENDAR FOR 1901-1902.

1901.

JULY.

S.	M.	T.	W.	T.	F.	S.
..	1	2	3	**4**	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	..	..	..
	..	..	..	..	..	..

AUGUST.

S.	M.	T.	W.	T.	F.	S.
..	..	..	..	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31
..	..	.	..	..	..	..

SEPTEMBER.

S.	M.	T.	W.	T.	F.	S.
1	2	**3**	4	5	6	7
8	9	**10**	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	..	..	..	..	..
..	.		..		..	..

OCTOBER.

S.	M.	T.	W.	T.	F.	S.
..	..	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31	..	..
.	..	..		..	..	..

NOVEMBER.

S.	M.	T.	W.	T.	F.	S.
..	..	..	.	..	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	**28**	29	30
..	..	..	..	.	..	..

DECEMBER.

S.	M.	T.	W.	T.	F.	S.
1	2	**3**	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	**21**
22	23	24	**25**	26	27	28
29	30	31	..	..	..	..
..	..	..		..	..	..

1902.

JANUARY.

S.	M.	T.	W.	T.	F.	S.
..	..	..	**1**	2	3	4
5	6	**7**	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	..
..	..	..	..	..	..	.

FEBRUARY.

S.	M.	T.	W.	T.	F.	S.
..	..	..	..	..	..	1
2	3	4	5	6	7	8
9	10	11	**12**	13	14	15
16	17	18	19	20	21	**22**
23	24	25	26	27	28	.
.	..	.	..	.	.	.

MARCH.

S.	M.	T.	W.	T.	F.	S.
..	..	..	..	..	..	1
2	3	4	5	6	7	8
9	10	**11**	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31	..	..	..	..	.

APRIL.

S.	M.	T.	W.	T.	F.	S.
..	..	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	..	..	..
..	.		..	..	.	..

MAY.

S.	M.	T.	W.	T.	F.	S.
..	..	.	..	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	**30**	31
..	..	..	..	..	..	

JUNE.

S.	M.	T.	W.	T.	F.	S.
1	**2**	**3**	**4**	**5**	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	..	..	..	..	..
	..	..	..	..	..	..

The year 1902-1903 will begin September 2, 1902.

University Calendar, 1901-1902.

FIRST TERM

SEPTEMBER	3	T	Entrance examinations and registration.	
	4	W	" " " "	
	5	T	" " " "	
	6	F	" " " "	
	7	S	" " " "	1 w
	9	M	Examinations end and registration completed.	
	10	T	Classes called for regular work.	
	14	S		2 w
	15	S	(First College classes organized, 1869.)	
	21	S		3 w
	28	S		4 w
OCTOBER	5	S		5 w
	12	S		6 w
	19	S		7 w
	26	S		8 w
NOVEMBER	2	S		9 w
	9	S		10 w
	11	M	Examinations for conditioned students.	
	16	S		11 w
	18	M	Examinations for conditioned students.	
	23	S	Term Examinations. I and II hour work	12 w
	25	M	" " III and IV hour work.	
	26	T	" " V and VI hour work.	
	27	W	" " VII and VIII hour work.	
	28	T	Thanksgiving Day.	
	30	S		13 w

SECOND TERM

DECEMBER	2	M	Registration for second term completed.	
	3	T	Classes called for regular work.	
	7	S		1 w
	10	T	Annual Meeting of the Board of Regents.	
	14	S		2 w
	21	S	Holiday Recess begins (no classes)	3 w
	25	W	Christmas Day.	

JANUARY	1	W	New Year's Day.	
	7	T	Work resumed in all departments.	
	11	S	....	4 w
	18	S	....	5 w
	25	S	....	6 w
FEBRUARY	1	S	....	7 w
	8	S	....	8 w
	10	M	Examinations for conditioned students.	
	12	W	Lincoln's Birthday.—Holiday.	
	15	S	....	9 w
	17	M	Examinations for conditioned students.	
	18	T	University Charter, 1868. General Sibley died, 1891.	
	22	S	Washington's Birthday—Holiday........................	10 w
MARCH	1	S	....	11 w
	3	M	Term examinations, I and II hour work.	
	4	T	" " III and IV hour work.	
	5	W	" " V and VI hour work.	
	6	T	" " VII and VIII hour work.	
	8	S	....	12 w

THIRD TERM

MARCH	10	M	Registration for third term completed.	
	11	T	Classes called for regular work.	
	15	S	....	1 w
	22	S	....	2 w
	29	S	....	3 w
APRIL	5	S	....	4 w
	12	S	....	5 w
	19	S	....	6 w
	26	S	....	7 w
MAY	3	S	....	8 w
	10	S	....	9 w
	17	S	....	10 w
	20	T	Senior examinations begin.	
	24	S	....	11 w
	27	T	Term examinations, I and II hour work.	
	28	W	" " III and IV hour work.	
	29	T	" " V and VI hour work.	
	30	F	Memorial Day—Holiday.	
	31	S	Term examinations, VII and VIII hour work..................	12W

COMMENCEMENT WEEK

SUNDAY	June 1	Baccalaureate Service, - - -	3:00 P. M.
		Alumni Prayer Meeting, - - - -	9:00 A. M.
MONDAY	June 2	Senior Class Exercises—Announcement by the class.	
TUESDAY	June 3	Senior Promenade—Announcement by the class,	8:00 P. M.
WEDNESDAY	June 4	Alumni Day—Meeting of Alumni, - -	7:30 P. M.
THURSDAY	June 5	Commencement Day—The Twenty-ninth Annual Commencement.	
		Graduating Exercises, - - - -	10:00 A. M.
		Alumni Banquet and President's Reception,	1:00 P. M.
FRIDAY	June 6	Summer Vacation Begins, - - - - -	13 w
		The year 1902-1903 will begin September 2, 1902.	

PROGRAM OF EXAMINATIONS, SEPTEMBER, 1901

THE COLLEGE OF SCIENCE, LITERATURE AND THE ARTS
THE COLLEGE OF ENGINEERING AND THE MECHANIC ARTS
THE SCHOOL OF MINES
THE COLLEGE OF LAW
THE COLLEGE OF DENTISTRY

The number placed after the subjects, when given, indicates the room in which the examination will be held.

DAY	HOUR	Subjects for admission to the freshman class.
TUESDAY, September 3,	8:00-10:30	†English Classics 13
	10:45- 1:15	*English Composition 1
	2:30- 5:00	*Elementary Algebra.......22
WEDNESDAY, September 4,	8:00-10:30	*Higher Algebra 22
	10:45- 1:15	*Plane Geometry...... 22
	2:30- 5:00	*Solid Geometry 22
THURSDAY, September 5,	8:00-10:30	†All History Subjects.......18
		†Civics 16
		†Political Economy..........16
	10:45- 1:15	*German 21
		*French 28
	2:30- 5:00	*Latin Grammar........... 4
FRIDAY, September 6,	8:00-10:30	*Greek 25
		*Cæsar 4
		†English Literature..... ...13
	10:45- 1:15	*Cicero...................... 4
		*Vergil 4
	2:30- 5:00	§Chemistry............ ....
		**Physics........... .. ....
SATURDAY, September 7,	8:00-10:30	‡Botany 29
		‡Zoology 35
		*Astronomy ....B
	10:45- 1:15	‡Geology 18
		‡Physiography 18
	2:30- 5:00	††Drawing 24
		††Shop Work ....

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* Main Building; † Library Building; ‡ Pillsbury Hall; § Chemical Laboratory; **Armory; †† Mechanic Arts Building.

Faculty and Instructors.

Cyrus Northrop, LL. D., President,	519 Tenth Avenue S. E.
Frank Maloy Anderson, M. A., Assistant Professor of History.	1629 University Avenue S. E.
William R. Appleby, M. A., Dean of the School of Mines and Professor of Metallurgy.	911 Fifth Street S. E.
Charles W. Benton, M. A., Litt. D., Professor of the French Language and Literature.	516 Ninth Avenue S. E.
Jabez Brooks, D. D., Senior Professor of the Greek Language and Literature.	1708 Laurel Avenue
Richard Burton, Ph. D., Professor of the English Language and Literature.	Hampshire Arms
John S. Carlson, Ph. D. Professor of the Scandinavian Languages and Literatures.	827 Seventh Street S. E.
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N. Y. Life Insurance Law Library	8,000 volumes
Minnesota Academy of Natural Sciences (pamphlets and volumes)	7,000 titles

ST. PAUL.

State Historical Library	67,000 volumes
State Library	33,000 volumes
Public Library	51,000 volumes
Total	382,000 volumes

The general library of the University contains about seventy thousand bound volumes, besides many thousand volumes of pamphlets, magazines, and reports. About one hundred and twenty periodicals are received regularly by the library, not inclusive of technical magazines and newspapers.

The library is open to students and the public from 8 a. m. to 9:30 p. m. every day of the University year, except Sundays and legal holidays.

Besides the general library of the University, there are a number of special libraries, consisting mainly of books of reference and current periodicals relating to technical subjects in connection with the several departments in engineering, botany, animal biology, law and medicine.

The law library contains the English and American reports most frequently cited, digests, dictionaries, and a full and excellent selection of standard text books.

The Nelson Law Library of 1,500 volumes donated to the University by the Hon. R. R. Nelson, of St. Paul, on his retirement from the Federal Bench, contains many rare English reports and treatises.

The Medical library contains a large and well assorted collection of books, sets of journals, bound and unbound pamphlets, relating to all branches of medicine. All of the leading medical journals are on file in the reading room. The various laboratories have also reference libraries devoted to their special lines of work.

The library has been greatly enriched by the bequest of the late Dean, Perry H. Millard, M. D., who bequeathed his entire private medical library to the department. This collection consists of several hundred volumes and pamphlets, including many rare and old medical works, sets of journals, especially rich in surgical works.

To all these library facilities may be added the Minneapolis Public Library, which is within easy reach of the University and is opened freely to the students of the University. The library contains over fifty-five thousand bound volumes; over fourteen hundred of the leading newspapers, magazines and periodicals of the world.

MUSEUMS.

The museums of the University contain material obtained from various sources arranged with special reference to its use for illustration. Among the more notable collections are the following:

(*a*) *In Geology and Mineralogy:* The Kunz collection of minerals, purchased of George F. Kunz: several suits of crystalline rocks secured from various sources; the Ward collection of casts contributed in part by citizens of Minneapolis; collections of the rocks, fossils, minerals and economic products of Minnesota; upwards of 9,000 entries gathered by the geological survey of the State; the Sardeson collection of paleozoic fossils of Minnesota, Wisconsin, Iowa and neighboring states comprising 4,500 entries and more than 30,000 specimens; a series of thin sections of typical rocks and minerals largely representing Minnesota localities; purchased material comprising a fine collection of crystals; 5,000 minerals and 3,000 specimens of economic minerals and crystalline rocks.

(*b*) *In Zoology:* All the material collected by the State Zoologist; a collection of mounted Minnesota birds representing about one-third of the species found in the State; a number of the mammals of the State, and a few from the more western states; a collection of fishes, molluscan shells, corals and other foreign material.

The ornithological room contains the excellent Thomas S. Roberts and Franklin Benner collections of skins, nests and eggs of Minnesota birds. Other groups of animals are more or less numerously represented, and are receiving annual additions from the Zoological Survey.

(*c*) *In Botany:* The general herbarium, numbering about 175,000 specimens, and comprising the series of plants collected by the State Botanist; an alcoholic collection of material for dissection; a collection of woods of Minnesota; a limited series of carboniferous and cretaceous fossil plants, including the Lesquereaux collection from the Minnesota River localities.

(*d*) *The Museum of Technology:* A cabinet of specimens illustrating the products and processes of applied chemistry is being collected by the professor of chemistry, as opportunity offers. The collection embraces fuel, ores, furnace products, textile materials, both raw and manufactured, dye-woods and other materials used in dyeing; specimens illustrating the bleaching and printing of cotton, linen and woolen goods, earthenware, pottery, etc.

(*e*) *The Classical Museum:* Some material illustrating classical geography, topography, chronology, mythology, archæology and art has been collected, consisting mainly of plans and charts, casts, pictorial illustrations, fac-similies of manuscripts and inscriptions.

(*f*) *In English:* A few fac-similes of manuscripts, plates that may serve for the purpose of archæological instruction, publications of texts, reprints of blackletter books and of original editions, photographs and portraits have been gathered.

(*g*) *Civil Engineering:* The department is collecting samples of road material, typical of the various localities of the State; leading materials used in street paving, such as granite, trap rock, brick, and asphalt. A set of standard sections of steel and wrought iron is provided for illustration in the study of structural design.

(*h*) *Mechanical Engineering:* The collection consists of models of mechanical motions especially relating to the work in kinematics; sectioned apparatus, such as injectors, water meters and steam separators; various collections of drop forgings in iron, steel, and copper; miscellaneous samples of commercial work representing the product of special machines; groups of standard nuts, bolts and screws; samples of belting, ropes, steel and iron cables, rawhide gears, and other material especially useful for illustrative purposes.

(*i*) *Electrical Engineering Museum:* This museum contains a growing collection of samples furnished by various manufacturers and dealers for demonstrating the merits of different products and for illustrating modern practice; an excellent collection showing the development of electrical instruments, lightning arresters, switches, primary and secondary batteries, early forms of dynamos and motors, lighting apparatus and various industrial applications of electricity; also a collection of samples from repair shops and elsewhere, illustrating the effects of wear, accidents and abuse.

ASTRONOMICAL OBSERVATORY.

The students' astronomical observatory contains a ten and one-half inch combined, visual, photographic and spectroscopic refracting telescope, constructed by Warner Swasey and Brashear; a photographic measuring machine by Repsold; a spectrometer by Brashear; a three-inch transit circle and chronograph by Fauth; a Howard astronomical clock.

GYMNASIUM.

The gymnasium is located in the Armory, and is well equipped with a variety of gymnastic appliances. The object of the gymnasium is to provide all of the students of the University opportunity for exercise to build up their general health. It also provides special training to correct physical defects and functional derangements. The gymnasium is in charge of a professional medical director and assistant, and the training is under their direct supervision. All young men are required to be examined by the medical director upon entering the University, and during their course as often as their physical condition may require. A thorough physical examination is offered each student immediately before and after the gymnasium course, and a record is made of the same. The examination of these records shows a marked improvement in the standard of health of the average student during his college course. Work in the gymnasium is required of all men in the freshman class, through the year, and the gymnasium is open at all times to all young men in the University, who are free to use the apparatus and to pursue a course of physical training under the direct supervision of the director and his assistant.

General Information.

THE UNIVERSITY YEAR.

The University year covers a period of thirty-eight weeks, beginning on the Tuesday before the first Thursday in September, and is divided into three terms. The first term has thirteen, the second twelve, and the third thirteen weeks. Commencement day comes on the first Thursday in June.

THE ONE MILE LIQUOR LAW.

A special act of the legislature provides that "it shall be unlawful for any person to sell or dispose of any spirituous, vinous or malt liquors within the distance of one mile of the main building of the University of Minnesota, as now located in the city of Minneapolis; provided that the provisions of this section shall not apply to that part of the city of Minneapolis lying on the west side of the Mississippi River"

STUDENTS' SOCIETIES.

RELIGIOUS.

The Students' Christian Association was organized by the students and faculty of the University in 1869; its object being, as stated in the constitution, to promote growth in Christian character, and to engage in such religious work as may be deemed expedient and necessary.

The Association owns a commodious building and is meant to be the rallying point of all the Christians in college. All persons in sympathy with the object of the association are eligible to membership.

The Young Men's Christian Association has as its object the promotion of "growth in grace and Christian fellowship among its members and aggressive Christian work, by and for students." The association rents the S. C. A. building and keeps it open, with a general secretary in charge, at all times. This building is meant to be the social and religious headquarters of all young men in the University.

The association maintains an employment bureau, whose services are free to students in all departments of the institution, and a committee to help students to find comfortable rooms and boarding places.

The association maintains an educational department where students can make up their entrance conditions without any charge for instruction.

The general secretary will be glad to correspond with any young man intending to come to the University. Address the General Secretary of the Y. M. C. A. University of Minnesota, Minneapolis, Minn.

THE YOUNG WOMEN'S CHRISTIAN ASSOCIATION is the center of Christian life among the young women of the University, and its object is the development of Christian character in its members and the prosecution of active Christian work among the young women of the University. The association has a room in the library building, which they have furnished, and which is always open to members and their friends. Regular weekly prayer meetings are held; also Sunday afternoon meetings. One-third of the members belong to Bible classes which meet each week for one hour. Any young woman wishing information in regard to the University is invited to correspond with the president of the association.

THE UNIVERSITY CATHOLIC ASSOCIATION.

The University Catholic Association was organized by the Catholic students in the spring of 1900. The purpose of the association is the study of the Bible and of the doctrines and history of the Catholic church. Membership is open to any one connected with the University. Regular meetings are held every Sunday afternoon in the rooms either of the Young Men's or of the Young Woman's Christian Association, through the courtesy of those organizations.

Aside from the religious objects, the association tends to promote good fellowship among its members. In the fall a reception is tendered to new students and during the year two or more socials are held.

Further information may be obtained by addressing the secretary of the association at the University.

LITERARY, SCIENTIFIC AND PHILOSOPHICAL

Literary Societies—These societies do excellent work; they are mainly debating clubs. Every one is cordially invited to attend the literary sessions, but the business sessions are usually held with closed doors. Any one wishing to join should make early application to some member of the society he prefers, as the membership is limited.

Federated Literary Societies—A federation including the Blackstone, Shakopean, Law Literary, Forum, Castalian, Kent, Minerva and Hermean literary societies. Organized for the promotion of general literary and rhetorical work, and for management and support of the interstate and intersociety debates.

Blackstone—Membership limit, 25; men: *Shakopean*—Membership limit, 35; men: *Forum*—Membership limit, 30; men: *Minerva*—Membership limit, 30; women: *Law Literary*—Unlimited; law students: *Castalian*—Membership limit, 35; men: *Kent*—Membership limit, 30; law students: *Hermean*—Membership limit, 30; men. *Theta Epsilon*—Membership limit, 30; women.

The Philological Society—The object of the philological society is to promote philological investigation and study.

Greek Club—Is a society organized by professors and students of the department of Greek.

Societas Latina is a society in the department of Latin, having for its special aim the securing of greater proficiency in reading and writing Latin.

The Graduate Club is a club organized for the purpose of fostering a greater interest in graduate work, for mutual help, and for the discussion of topics under investigation.

The Dramatic Club is organized for the study and practice of dramatic art.

The Engineers' Club meets once a week to listen to addresses by prominent engineers and for the discussion of various engineering topics.

The Geological Club is an organization of instructors and students interested in geology, for the discussion of geological problems.

The Scandinavian Literary Club is an organization whose purpose is to promote interest in the study of Scandinavian literatures.

The Federated Debating Board has charge of home and inter-collegiate oratorial contests.

The Economic Club meets twice a week for debate in economic and political subjects.

The Pedagogical Society is organized for the purpose of the investigation and discussion of pedagogical problems.

The Art Club is an orgaization of instructors and students interested in art work. The club meets once a month for lectures and discussion of art topics.

The Mining Society is an organization of mining engineering students who meet for the pursose of hearing lectures and discussing mining engineering problems.

The Camera Club is an organization of instructors and students interested in photography and photographic chemistry.

The Botanical Students' Journal Club is an organization of juniors, seniors and graduate students, of the department of botany, for the review of current botanical literature.

The Zoological Journal Club includes advanced students who meet for the discussion of current zoological literature.

The Zoological Reading Club is for instructors and graduate students. Its purpose is the reading and discussion of philosophical works on zoology.

The Northern Oratorical League is composed of the oratorical associations of the University of Michigan, Northwestern University, the University of Wisconsin, Oberlin College, the State University of Iowa, the University of Chicago, and the University of Minnesota. Its purpose is to foster an interest in public speaking and to elevate the standard of oratory by holding annual contests. The contests are open only to undergraduates.

The Central Debating League is composed of the debating associations of the University of Michigan, the University of Minnesota, Northwestern

University, and the University of Chicago. Its purpose is to discuss in public leading questions of the day and in this way to develop ready and forceful speakers.

The four universities are arranged in two groups for the semi-final debates, which are held the second Tuesday in January. On the first Friday in April in each year the winners from the groups meet in a final debate in the city of Chicago.

ATHLETICS.

The Athletic Association is an organization having for its object the general physical well-being of the students, and the encouragement of a proper spirit in favor of hearty, manly sports.

Control of Athletics. The athletic sports of the University are under the supervision of a Board of Control, made up of eleven members, two of whom are members of the faculty, two are alumni and seven are students. This board has general supervision of all matters connected with athletic contests: they pass upon the eligibility of players, investigate charges of misconduct and arrange the schedule of games. It is the purpose of this board to foster a spirit in favor of fairness and honesty in all athletic contests

Northrop Field is an enclosed athletic field containing about three and one-half acres immediately adjoining the armory.

SCHOLARSHIPS.

It is the policy of the University to establish scholarships in the different departments where extra help is needed for instruction, under regulations somewhat as follows:

1. The appointments are made by the executive committee of the Board of Regents, upon the recommendation of the department in which the appointment is desired, after approval by the general faculty.
2. Recipients of scholarships may be either graduate or undergraduate students.
3. The scholarships are not intended as gifts or benefactions from the State to the recipients, but as provisions under which services may be rendered the University.
4. It is understood that these services are of a nature which shall assist the holder of a scholarship to attain the mastery of some line of work in the department to which he is appointed.

PRIZES.

THE PILLSBURY PRIZES,

Three prizes of $30, $25 and $20, offered by the Hon. J. S. Pillsbury, are awarded every year for the best work in the rhetorical department, as evidenced finally by an oration in public.

THE '89 MEMORIAL PRIZE IN HISTORY.

The class of 1889, at graduation, established a prize of $25 each year, to be known as the *'89 Memorial Prize,* and to be given for the best thesis in history. The award is made by a professor of history in some other institution.

THE MOSES MARSTON SCHOLARSHIP IN ENGLISH.

Some of the friends and pupils of the late Professor Moses Marston, Ph. D., have given and pledged one thousand dollars as a memorial fund. The annual income of the fund is used to help some student in the long English course. The award of the income is made on the basis of pecuniary need and of deserving scholarship.

PRIZES IN ENGLISH.

The Hon. John B. Gilfillan offers $75, in three prizes, for the best specimens of English prose.

PAIGE LAW PRIZE.

Professor James Paige of the College of Law offers an annual prize of forty dollars for the best thesis presented by any member of the graduating class.

THE ALBERT HOWARD SCHOLARSHIP FUND.

Under the last will and testament of Mr. James T. Howard, of the town of St, Johnsbury, Vermont, $4,166.81 was left to the University to establish a scholarship to be known as the "Albert Howard Scholarship." This scholarship is assigned by the executive committee, upon the recommendation of the general faculty.

THE GILLETTE-HERZOG PRIZES.

The Gillette-Herzog Manufacturing Company offer for competition, by the students of the college of engineering and the mechanic arts, two annual prizes, viz.

A first cash prize of seventy-five dollars, accompanied by a gold medal.

A second cash of fifty dollars, accompanied by a gold medal.

A third cash prize of twenty-five dollars, accompanied by a gold medal.

The subjects admitted to competition are:

1. Civil engineering.
2. Mechanical engineering.
3 Electrical engineering.

THE SCHURMEIER PRIZE.

Hon. T. L. Schurmeier, of St. Paul, offers through the department of Political Science, a prize of twenty dollars for the best essay presented by an undergraduate student on the subject of "The Place of Cities, in Industrial Organization." (*a*) The consumption of wealth. (*b*) Population, wages and employment. (*c*) Relation to political problems —Any or all of these sub-divisions may be discussed in the essay. The essay must consist of three thousand words, and should be handed to the professor of economics on or before May 10. Judges may reject any or all essays at their pleasure.

THE WILLIAM JENNINGS BRYAN PRIZE.

The Hon. William Jennings Bryan has given the University the sum of $250.00 for the encouragement of studies in political science. The annual income will be given as a prize to the writer of the best essay

The topic of the year 1900-1901 is based upon the following quotation —"If the Bacon resolution had been adopted by the senate and carried out by the president, either at the time of the ratification of the treaty or at any time afterward it would have taken the question of imperialism out of politics and left the American people free to deal with their domestic problems."

The competition is open to all students of the college of science, literature and the arts.

The essays must contain not less than 2000 nor more than 3000 words neatly type written, and must be handed to the professor of political science on or before May 10, 1901. The usual devices for securing impersonality must be adopted. The judges will be appointed by the president of the University.

THE TIMES GOOD ROADS PRIZES.

The Times Newspaper Company offers three gold medals to the sophomore civil engineers, for the best essays and studies in good roads.

MEYSENBURG PRIZE.

A prize of $100 will be paid to the student of the senior class who writes and delivers the best oration upon a subject to be announced each year by the President of the University. The orations are to be placed in the hands of the President not later than the beginning of the third term. A committee of the Faculty appointed by the President will decide upon the three best orations, which will then be delivered some time during the latter part of the third term by the students writing them. The prize will be awarded by a committee consisting of seven members of the Faculty to be appointed by the President. For the establishment of this prize the University is indebted to the liberality of Mr. Otto W. Meysenburg of Chicago, Ill.

PUBLICATIONS.

The University Bulletins are published by authority of the board of Regents, six times a year,—every six weeks during the University year. Bulletins will be sent gratuitously, postage paid, to all persons who apply for them.

The Minnesota Daily is published five times each week during the University year, by an organization of University students.

The Junior Annual, called the "Gopher" is a book published annually by the junior class of the University.

The Students' Hand Book, containing items of information, especially valuable to new students, is issued by the Young Men's and Young Women's Christian Associations at the beginning of the college year.

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The Minnesota Magazine is a monthly magazine devoted to the cultivation of literary taste and effort among the students of the University. It is managed by a board of editors chosen from the senior class.

The Year Book of the Society of Engineers. The book is published yearly by the society of engineering students. It is devoted to the publication of articles upon engineering subjects by professors and students in the college of engineering and the mechanic arts.

EXPENSES.

In past years several students have kept careful account of their expenses for the University year. The following is a detailed report of the result:

STUDENT ONE was supported by his parents; the following is a statement of his expenses:

Board, 35 weeks (this leaves out of account a vacation of three weeks spent at home)	$122.50
Room, nine months	49.50
Text books	22.75
Street car fare	4.85
Railroad fare, six trips home	7.44
Clothing	62.50
Laundry	21.35
Sundries	22.65
Total for the year	$313.54

STUDENT TWO earned everything that he spent during the year. He began school in the fall with fifty dollars in the bank; at the end of the year he had ten dollars in the bank. He earned his money by work as printer. The following is a statement of his expenses:

Board and room	$160.00
Laundry	15.00
Medical attendance	20.00
Clothing	50.00
Books	30.00
Incidentals (this includes street car fare, railroad fare, etc.)	30.00
Total for the year	$305.00

STUDENT THREE worked for his table board, his parents paying most of his other expenses. The following is a statement of his expenses:

Board, 38 weeks	$142.50
Room	34.68
Laundry	10.49
Books	18.39
Railroad fare and express	8.53
Street car fare	8.45
Clothing	26.29
Sundries	19.50
Total for the year	$268.83
Received from parents	96.33
Earned for himself	$172.50

STUDENT FOUR, a member of the senior class, paid expenses as follows:

Board, room, laundry and fraternity dues (39 weeks)	$208 75
Clothing	74.25
Class dues	8.25
Books	29.10
Stamps	3 41
Church donations and amusements	24.90
Railroad fare	16.25
Street car fare	4.95
Incidentals	27.23
Total	$397.09

Of this amount he earned all but $125 by working in an office. This statement includes all expenses incident to graduation and commencement week.

These students are fairly representative; they were neither extravagant nor did they deny themselves unduly to get along. Board could have been obtained in clubs at from fifty to seventy-five cents per week cheaper than any of them paid.

The student who learns some trade before coming to the University has a great advantage over the student who has to earn his money by ordinary manual labor. Students have earned their whole expenses while attending the University, and have made good records at the same time. Other students have done so much work that they have not been able to keep up their studies, and have thus missed the one thing for which they were attending the University.

If it is possible for the student to have a part of his expenses paid, he should not attempt to earn his way entirely by his own exertions. It is a comparatively easy thing for a young man to earn half his living while attending the University and yet do good work in his classes. Students who want work seldom fail to find it. In coming to the University the student should bring enough money with him so that he can live comfortably for a few weeks until he can find something to do.

The following statement, while it can hardly be considered an average one, shows what students have done and what they can do. The young man has just completed his junior year with a record for scholarship decidedly above the average:

Class and society dues		$ 6.00
Room rent (9 months)		36.25
Board (39 weeks)		85.05
Laundry		9.95
Books and stationery		13.95
Street car fare		3.80
Clothing		20.80
Benevolence		17.35
Miscellaneous		24 35
Total expenses		$217.50
Saved during summer	$ 35.00	
Salary—janitor of church	225.00	
Other work	12.75	
		$272.75
Expenses		217.50
Balance, over expenses		$55.25

EXPENSES OF YOUNG WOMEN.

The following is the record of one of two sisters who kept house during their sophomore year:

Rent	$ 40.75
Board, light, laundry	52.42
Fuel	7.25
Railroad fare and cartage	27.80
Street car fare	5.85
Stationery	3.97
Amusements and presents	10.56
Personals and clothing	72.51
Incidentals	18.94
Total expenses	$240.05

The following is the record of a young lady who boarded in a private family.

Board	$138.00
Room for nine months (four with room mate)	58.00
Railroad fare	30.22
Street car fare	6.00
Text books	16.12
Clothing (besides that brought from home) and laundry	67.59
Fraternity and class dues, Christian association and other religious organization	20.19
Sundries	19.48
Total for the year	$355 60

The following is a statement of expenses of a young lady during her freshman year in the medical department:

Board and room (32 weeks)	$128.00
Books and instruments	30.05
Railroad fare	21.00
University fee	100.00
Clothing and incidentals	72.65
Laundry	7.50
Total	**$359.20**

The following is the record for a young lady during her freshman year in the college of science, literature and the arts.

Board, room, fuel and light	$75.21
Clothing, besides that brought from home	32.63
Railroad fare, street car fare and cartage	9.32
Stationery	2.16
Books and fees	23.26
Y. W. C. A., fraternity and amusements	7.50
	$150.08

A pamphlet has been published containing five papers, (one by a young woman), relating actual experience of students who have made their way through the University.

Students who contemplate making their way through college will find here stated the stern and unpleasant side as well as the brighter side of such a life. A copy of these papers will be sent free to any address upon application.

THE

GRADUATE DEPARTMENT

The Graduate Department.

This department affords an extension of the work of the college of science, literature and arts, the college of engineering, and the mechanic arts, the school of mines, the college of law, and the college of agriculture. It meets the threefold purpose of extending general culture, for which master's degrees are offered; of encouraging the mastery a specialty for which the degree of doctor of philosophy is given, of providing for those who desire a more thorough acquaintance with particular subjects than is offered in undergraduate work, but are not candidates for degrees.

REGISTRATION.

Those who wish to take any of these courses must present their application to the registrar, and register for whatever work they may wish to pursue. All students doing work in this department are required to pay a fee of ten dollars. Those doing laboratory work must pay the usual laboratory dues in addition to the regular fee.

THE MASTER'S DEGREE

COLLEGE OF SCIENCE, LITERATURE AND THE ARTS.

I. The degree of master in science, literature and arts will be conferred on a bachelor of this or any other reputable college or university who, not sooner than one year after graduation, if in residence at this University, and not sooner than two years after graduation, if not in residence, shall pass an examination on certain prescribed lines of study, and present a satisfactory thesis.

II. A candidate for a degree is required to present his application on the proper blank, stating the particular degree desired, the several subjects selected in which to be examined, and the title of thesis. Graduates of other colleges or universities must present their diplomas or other credentials on filing their applications. After the approval of the application by the faculty of the college, no changes or departures will be permitted.

Applicants for graduate work shall be referred, with the necessary credentials, to the committee on graduate studies and degrees, who shall examine said applicant and report accordingly to the general faculty. Provided always that the committee on graduate studies and degrees may prescribe for the candidate such preliminary studies as they may deem necessary for entrance on his work. The registrar shall notify professors of the lines selected by the applicant in their department. Professors shall report to the general faculty early in the third term of each year, the names and work of the graduate students actively at work in their departments.

The professors in charge of the subjects pursued by the candidate for the master's degree, shall be the examining committee of said candidate, of which the professor in charge of the major subject selected, shall be the chairman, and shall make its report to the committee on graduate studies and degrees.

III. Tables of studies offered to candidates:

- A. Classical philology:
  1. Greek.
  2. Latin.
  3. Sanskrit.
  4. Semitic languages.
- B. Modern philology:
  1. English.
  2. French (Spanish and Italian.)
  3. German.
  4. Scandinavian languages.
- C. Biological sciences:
  1. Botany.
  2. Zoology.
  3. Paleontology.
- D. Physical sciences:
  1. Geology—lithological.
  2. Chemistry.
  3. Physics.
  4. Mineralogy.
- E. Mathematical sciences:
  1. Mathematics.
  2. Astronomy.
- F. Philosophical sciences:
  1. History.
  2. Economics.
  3. Political science.
  4. Philosophy.
  5. Pedagogy.
  6. Social science.
  7. Archæology.

IV. THE AMOUNT OF WORK done by the candidate shall be equivalent to that done by the senior class, viz: three terms of four subjects each term, with thesis in addition.

NOTE—It will be observed that this is equivalent to 12 terms of work on one subject. Hence, estimates of the time to be occupied will be stated in *twelfths* of a year.

V. Method of Selecting Work:

1. The candidate shall select work in three distinct departments.

2. One of the subjects he shall indicate as a major, the other two as minors.

3. The candidate shall devote not less than six-twelfths of his work to the major, and not less than one-twelfth to each minor.

4. The thesis shall be on some theme connected with the major subject.

The following special regulations are to be observed with reference to the different degrees:

a. For the degree of Master of Arts, at least one of the three subjects selected shall be from division A in the table in paragraph III.

b. For the degree of Master of Science, at least one of the three subjects selected shall be from divisions C, D, E, F, in the same table.

For the degree of Master of Literature, at least one of the three subjects shall be selected from division B, in the same table.

VI. The proficiency of candidates shall be determined by examination only.

VII. All examinations shall be held at the University, at such time and in such manner as may be directed by the faculty. Provided, however, that the committee to examine each candidate shall consist of not less than three professors, and provided that the examinations must be completed by the second Thursday preceding commencement.

THE COLLEGE OF ENGINEERING, AND THE MECHANIC ARTS AND THE SCHOOL OF MINES.

All regulations governing candidates for the Master's degree shall apply to the candidates for second degrees in the college of engineering and the mechanic arts and the school of mines, particularly as to the amount of work done, the method of selecting work, degree of proficiency expected and the time and manner of conducting the examination.

These courses are a continuation of the lines of undergraduate work in that department which has conferred upon the student his first degree. Upon the completion of a full year of work and by passing a satisfactory examination, with a technical thesis, the student is entitled to a second degree.

THE COLLEGE OF AGRICULTURE

The college of agriculture provides graduate work, under the same general plan as the college of science, literature and the arts, Work leading to advanced degrees are open to bachelors of this or any other reputable agricultural college. Applicants for graduate work in this college are referred to the dean of the agricultural college and committee on graduate work. See statement under the department of agriculture.

COLLEGE OF LAW.

For the benefit of those students who wish to pursue their legal studies further than they are able to do in the undergraduate course, graduate courses are offered.

See statement under college of law.

The object of this course is to afford opportunity to gain a broader view of jurisprudence and also to gain a greater familiarity with the particular practice of Minnesota.

Those who enter this course as candidates for the degree must have already received the degree of bachelor of laws.

DEGREE OF DOCTOR OF PHILOSOPHY.

The degree of Doctor of Philosophy will be conferred on bachelors of this or any other reputable college or university within not less than three years after graduation therefrom, under the following conditions:

I. The candidate shall elect work in three distinct departments—a major subject in one department, and two minor subjects in other departments, and it shall be permissible for the committee on graduate studies and degrees to prescribe for the candidate such preliminary studies as they may deem necessary for entering upon the work. Within the major subject the candidate shall choose a special field.

The work included in a minor shall be equivalent to at least one year's work in one subject.

II. The candidate shall evince on his final examination an exhaustive knowledge of the special field selected, and shall show such acquaintance with the other studies of the major subject, and with the minor subjects as the faculty may require.

III. A committee, consisting of the heads of departments in which the candidate's subjects fall, shall have the direction of his work, subject to the approval of the faculty. The chairman of the committee shall be the professor in charge of the candidate's major subject.

IV. The candidate shall present a thesis on some subject connected with his special field work, which thesis shall be the result of original investigation by the candidate, and shall be a contribution to knowledge.

V. Candidates for this degree shall ordinarily be required to devote three full years of graduate study to preparation for the final examination, but if the study be not the candidate's sole occupation during that period, then the time of preparation shall be extended as the faculty may deem proper.

VI. Candidates shall be in actual residence at the University and shall pursue their studies therein at least two years; they may however, offer in lieu of one of these two years an equivalent term of resident graduate work in some other institution, it being always required that they be in residence at the University the year next preceding the final examination. Candidates shall be regarded as in residence only when they carry on their work, in all essential respects, at the University itself.

VII. At the beginning of the year next preceding his final examination, the candidate shall pass a preliminary examination on the work for his degree that he has done up to that time

VIII. A fair copy of the thesis shall be placed in the hands of a committee of the faculty on or before the first day of April next preceding the final examination. No candidate shall be admitted to the final examination unless his thesis shall be approved by the committee.

Each successful candidate shall deposit with the librarian two typewritten copies of his thesis, as soon as the same shall have been approved by the examining committee. The theses must be printed upon a sheet eight and and one-half by eleven inches, when trimmed. The size of the written page to be six by eight inches. Binding to be half roan with paper sides and marbled edges.

IX. The final examination for this degree shall be held on or about the third Tuesday in May, as the president of the University may decide.

X. Both the preliminary and the final examination for the degree of doctor of philosophy shall be held in the presence of the general faculty, and shall be conducted as the faculty may direct. A quorum for the examination shall be five.

XI. In addition to passing the final examination, the candidate shall make a public defense of his thesis at such time and place as the general faculty may determine.

Candidates for the degree of doctor of philosophy shall have a reading knowledge of German and French.

THE COLLEGE OF

SCIENCE,
LITERATURE AND
THE ARTS.

The College of Science, Literature and the Arts.

THE FACULTY.

CYRUS NORTHROP, LL. D., *President.*
WILLIAM W. FOLWELL, LL. D., *Professor of Political Science.*
JABEZ BROOKS, D. D., *Senior Professor of Greek.*
CHARLES N. HEWITT, M. D., *Professor of Sanitary Science.*
JOHN G. MOORE, B. A., *Professor of German.*
CHRISTOPHER W. HALL, M. A., *Professor of Geology and Mineralogy.*
JOHN C. HUTCHINSON, B. A., *Professor of Greek.*
JOHN S. CLARK, B. A., *Professor of Latin.*
JOHN F. DOWNEY, M. A., C. E., *Professor of Mathematics.*
MARIA L. SANFORD, *Professor of Rhetoric and Elocution.*
CHARLES W. BENTON, M. A., Litt. D., *Professor of French.*
HENRY F. NACHTRIEB, B. S., *Professor of Animal Biology.*
FREDERICK S. JONES, M. A., *Professor of Physics.*
CONWAY MACMILLAN, M. A., *Professor of Botany.*
FREDERICK J. E. WOODBRIDGE, M. A , *Professor of Philosophy.*
WILLIS M. WEST, M, A., *Professor of History.*
DAVID L. KIEHLE, LL. D., *Professor of Pedagogy.*
GEORGE B. FRANKFORTER, M. A., Ph. D., *Professor of Chemistry.*
JAMES RICHARD JEWETT, Ph. D., *Weyerhaeuser Professor of Semitic Languages and History.*
FRANCIS P. LEAVENWORTH. M. A., *Professor of Astronomy and Director of the Observatory.*
RICHARD BURTON, Ph. D., *Professor of English.*
FREDERICK KLAEBER, Ph. D., *Professor of Comparative and English Philology.*
JOSEPH BROWN PIKE, M. A., *Professor of Latin.*
JOHN S. CARLSON, Ph. D., *Professor of Scandinavian languages and literatures.*
CHARLES P. SIGERFOOS, Ph. D., *Professor of Zoology.*
FRANK L. MCVEY, Ph. D., *Professor of Private Economics.*
JOHN ZELENY. B. S., *Associate Professor of Physics.*
HENRY L. WILLIAMS, M. D., *Director of Athletics.*
MATILDA J. WILKIN, M. L., *Assistant Professor of German.*
CHARLES F. SIDENER, B. S., *Assistant Professor of Chemistry.*
EDWARD EUGENE MCDERMOTT, M, S., *Assistant Professor of Rhetoric and Elocution*
WILLIAM H. KIRCHNER, B. S., *Assistant Professor of Drawing.*
SAMUEL G. SMITH, D. D., *Lecturer on Sociology.*
CHARLES F. MCCLUMPHA, Ph. D., *Assistant Professor of English Literature.*
EDWARD E. NICHOLSON, M. A., *Assistant Professor of Chemistry.*
LOUIS J. COOKE, M. D., *Director of the Gymnasium.*
FRANK M. ANDERSON, M. A., *Assistant Professor of History.*
NORMAN WILDE, Ph. D., *Assistant Professor of Philosophy.*
CARL SCHLENKER, B. A., *Assistant Professor of German.*
ALBERT B. WHITE, Ph. D., *Assistant Professor of History.*
HAYDN S. COLE, 1st Lieutenant U. S. A., *Military Science and Tactics.*

INSTRUCTORS.

George E. Bauer, Ph. D., *Mathematics.*
Elizabeth S. Beach, B. S,, *History.*
Frederick E. Beckman, Ph. D., *Spanish and French*
Charles P. Berkey, Ph. D., *Mineralogy.*
Emma Bertin, *French.*
Gilbert Ames Bliss, Ph. D., *Mathematics.*
Amelia I. Burgess, *Drawing.*
Anna M. Butner, *Physical Culture.*
Henrietta Clopath, *Drawing.*
David E. Cloyd, *Pedagogy.*
Ada L. Comstock, M. A., *Rhetoric.*
Henry A. Erikson, B. E. E., *Physics.*
Oscar W. Firkins, M, A., *Rhetoric.*
Harlow S. Gale, B. A., *Psychology.*
Paul M. Glasoe, M. S., *Chemistry.*
John E. Granrud, Ph. D., *Latin.*
Jane Kennedy, M. D., *Medical Examiner for Women.*
Marco F. Liberma, *French.*
Jennings C. Litzenberg, B. S., M. D., *Gymnastics.*
Louis C. Luhr, B. A., *German.*
Harold L. Lyon, B. S., *Botany.*
Oscar W. Oestlund, M. A., *Animal Biology.*
Levi B. Pease, M. S,, *Chemistry.*
Frances B. Potter, M. A., *English.*
Marion Potter, M. L., *English.*
Edward P. Sanford, B. A., *Rhetoric.*
Frederick W. Sardeson, Ph. D , *Paleontology.*
Charles A. Savage, B. A., *Latin.*
William A. Schaper, Ph. D., *Political Science.*
Waldemar Schulz, Ph. D., *German.*
Josephine E. Tilden. M. S., *Cryptogamic Botany.*
William A. Wheeler, B. Ag., *Botany.*
Helen A. Wilder. B. S., *Rhetoric.*
Anthony Zeleny, M. S., *Physics.*

ASSISTANTS.

Marguerite Barbour, *Physical Culture.*
Joseph W. Beach, B. A., *Rhetoric.*
Frank W. Emmons, B. S., *Chemistry.*
Henry Libby, *Astronomy.*
Hannah R. Sewall, Ph. D., *Political Science.*
David F. Swenson, B. S., *Philosophy.*

SCHOLARS.

Frederick K. Butters, B. S., *Botany.*
Joseph E. Guthrie, B. S., *Animal Biology.*
J. Burt Miner, B. S., L. L. B., *Psychology.*
Otto Rosendahl, *Botany.*
Charles Zeleny, B. S., *Animal Biology.*

ADMISSION.

Examinations for admission are held only at the beginning of the year. See calendar and program of examinations.

Students prevented from entering at the beginning of the year may be admitted at a subsequent date, when the circumstances are such as to justify the action. Such students are, however, at a great disadvantage, and all students expecting to enter the University are urged to be present at the beginning of the year.

All applicants should present themselves to the registrar, who will furnish them with application blanks and directions how to proceed with their examinations and registration.

GENERAL REGULATIONS GOVERNING ADMISSION.

I. Students will be admitted to the freshman class on **passing the regular entrance examinations.**

II. No student will be admitted **if conditioned in more than three half-year subjects,** or their equivalent.

III. Graduates of any Minnesota State high school will be admitted **without examination, provided—**

(1) That the school maintain a **full four-year course** of high school work.

(2) That the applicant present to the registrar the principal's certificate showing the satisfactory completion **of all the studies required for admission** to the desired University course.

IV. Graduates of Minnesota State high schools, who are deficient in **not more than three half-year subjects,** or their equivalent, **may be excused** from entrance examinations **in such subjects as the enrollment committee may decide;** such candidates should present themselves to that committee **not later than Tuesday of examination week.**

V. Graduates of Minnesota State high schools whose principal's certificate shows them to be deficient in **more than three half-year subjects,** or their equivalent, even though they have made such additional preparation as they deem necessary, must take, nevertheless, the regular entrance examinations in all subjects, as provided in sections I and II, unless excused by vote of the faculty; and persons wishing to present reasons for such excuse **should report to the enrollment committee not later than Tuesday of examination week.**

VI. Graduates of the **advanced courses of Minnesota normal schools** will be admitted upon the same terms as graduates of State high schools.

VII. Any Minnesota high school or academy **not under supervision of the State High School Board,** but requiring for graduation **a four-years' course,** exclusive of the common school branches, conforming **essentially in distribution of time** to the entrance requirements of at least one of the University courses, will, upon application, be inspected by a committee, and, after favorable recommendation, **may be accredited by the faculty** in all respects as are the state high schools, **provided,—**

(1) That the school be **open to inspection** at any time by the University, and

(2) That it take such **supplementary examinations as may be prescribed** from time to time.

VIII. Graduates from schools in other states, whose diplomas admit to **reputable colleges,** will be received subject to the regulations that apply to graduates of Minnesota State high schools.

IX. Applicants from schools not coming within any of the above classes **must take the regular entrance examinations,** or present State High School Board Certificates.

Students bringing records from accredited schools are required to present them on the blank form provided for the purpose by the University. Blank forms may be obtained from the Registrar. No other form or certificate will be accepted.

High School Board certificates will be accepted in lieu of an examination in the subjects which they represent.

In all cases the faculty reserves the right to require a student to take supplementary examinations if he does not sustain himself creditably in his course.

REQUIREMENTS FOR ADMISSION TO THE FRESHMAN CLASS.

N. B.—Time element, as indicated with each subject, is essential.

A three years' course of reading in English classics.
English Composition, one year.
Algebra, elementary, one year.
Algebra, higher, one-half year.
Geometry, plane, one year.
Geometry, solid, one-half year.

In addition to the above named subjects, which are required for all courses, and for which substitutes cannot be accepted, applicants shall present evidence of preparation in **eight** year-credits, or their equivalent to be chosen from the following list:

Latin, (four years.)
  Grammar, one year.
  Cæsar, four books, one year.
  Cicero, six orations, one year.
  Vergil, six books, one year.
Greek, (two years.)
  Grammar, one year.
  Anabasis, four books, one year.
German, (two years.)
  Grammar, one year.
  Literature, one year.
French, (two years.)
  Grammar, one year.
  Literature, one year.
English.
  Latin element, one year. Latin grammar will be accepted in lieu of this subject.
  Literature, one year.
History, Greece and Rome, one-half year.
  England, one-half year.
  Modern, one-half year.
  Medieval, one-half year.
  Senior American, one-half year.
Civics, one-half year.
Political economy, one-half year.
Physics, one year.

Chemistry, one year.
Botany, one-half or one year.
Zoology, one-half or one year.
Astronomy, one-half year.
Geology, one-half year.
Physiography, one-half year.

As preparation for the various courses, applicants shall choose from the list given above, as follows:

For the **scientific** and **civic** courses, applicants are unrestricted in their choice.

For the **classical** course, **four** year-credits shall be **Latin,** and **two** year credits shall be **Greek.**

For the **literary** course, **four** year credits shall be **Latin**, or **two** year, credits shall be either **German or French.** (One year of each will not be accepted,)

SYLLABUS.

The following statements indicate, in a general way, the ground expected to be covered in the study of the various subjects accepted for admission.

English Classics, (three years averaging not less than three hours per week.)

In order to secure a definite plan of study and unity of method on the part of preparatory schools, the requirments in English are outlined below somewhat in detail. Where texts are mentioned, they are merely suggestive and not arbitrary. Equivalents will be accepted in lieu of any of the texts mentioned.

English Classics—(a).

A critical reading, in class, of English masterpieces, with composition work based upon the same. The following lists are suggested as well adapted for such study:

Shakspere, "Macbeth;" Milton, "Paradise Lost," books i and ii; Burke, "Conciliation with America;" Carlyle's essay on "Burns."

In the study of these works the student should come to know the leading facts connected with the author and his time; he should be familiar with the subject matter of the work; thoroughly at home with the story; and have a clear idea of the form and structure of the work.

The teacher should call for frequent written exercises, such as will naturally suggest themselves. For instance, in "The Merchant of Venice," the following are among the topics that might be suggested:

The historical setting of the play; the Jew in Europe, as depicted by the play; Shakspere's purpose in the character of Shylock—to make him hateful or an object of pity; Portia's judgments; the comparison of certain characters.

English Classics—(b).

A less critical knowledge of other standard or classic works which may, perhaps, be read by the student at home, with written reports and brief oral discussions in class. Somewhat greater latitude is to be allowed here. The following works are noted as indicative of the minimum amount of work expected.

At least two of Shakspere's plays, besides the one studied critically.
One of Irving's works.
One of Hawthorne's novels.
Stevenson's "The Black Arrow."
One of Webster's orations.

English Composition and Rhetoric, (one year).

Candidates are expected to show a familiarity with the principles and technical terms in ordinary high school texts upon the subject, whether acquired by the direct study of such texts, or mainly by the study of selected English masterpieces. It should not be forgotten that the main purpose of this subject is to teach the student to use language correctly and forcibly. To this end students should be given constant exercise in composition writing. A knowledge of the subject matter of the texts used will be considered of less importance than the demonstration of ability to write good English.

A full year of work in the high school, five hours per week, should be devoted to this subject.

Elementary Algebra, (one year).

Addition, subtraction, multiplication, division, factoring highest common divisor, lowest common multiple, fractions, simple equations (with one, two, and several unknown quantities) followed by problems, theory of exponents, involution (including the binomial theorem for positive integral exponents), evolution, radicals, inequalities, ratio, proportion, progression, and quadratic equations with problems.

Higher Algebra, First Part (one-half year).

While this subject does not include any topics not named under elementary algebra, a much fuller treatment of those topics is expected in this work. Principles as well as processes should be learned, theorems and rules should be rigorously demonstrated, the exercises and problems should be more difficult, and students should be drilled in short methods and rapid work. Unless candidates have a good knowledge of the fundamental topics named below, they are not prepared to pursue successfully at the University the second part of higher algebra.

The topics are addition, subtraction, multiplication, division, factoring, highest common divisor, lowest common multiple, fractions, theory of exponents, involution, evolution, surds, imaginaries, and simple equations with problems.

Plane Geometry, (one year.)

Any of the standard texts on this subject will furnish the necessary preparation. Isoperimetry, symmetry, and maxima and minima of figures are not required. The exercises requiring solutions and demonstrations should not be omitted.

Solid Geometry, (one-half year).

Any of the standard texts on this subject will furnish the necessary preparation. The exercises requiring solutions and demonstrations should not be omitted.

Latin Grammar, (one year).

This will include the subjects of orthography, etymology and syntax, Proficiency is particularly desired in the following subjects: the analysis of the verb forms, the rules of syntax, and the principal parts of the irregular verbs.

Cæsar, (one year).

First four books, or selections from the seven books equivalent to four; or three books, with thirty pages of Cornelius Nepos. Special attention should be paid to the translation of passages of the text into correct and idiomatic English; grammatical questions connected with the text; more especially on the subjunctive mood, indirect discourse and the sequence of tenses. The pupil should be able to rewrite in *oratio recta* all the passages of *oratio obliqua* that occur in the text. The student is expected to be familiar with the life of Cæsar and an account of his wars.

Cicero, (one year).

Six orations; four against Catiline, and any two of the following: "Poet Archias" "Ligarius," "Marcellus," "Manilian Law" (to count as two orations), the Fourteenth Phillipic. The student should be familiar with the life of Cicero and the history of his times.

Vergil, (one year).

Six books of Æneid or five books of Æneid and one of the Metamorphoses of Ovid. The student must be familiar with the life of Vergil, and an account of his times and writings. A correct rythmical reading of the text is to be encouraged.

Greek Grammar, (one year).

Xenophon's Anabasis, (one year)—Four books.

English, the Latin element, (one year).
Latin grammar will be accepted in lieu of this requirement.

English Literature, (one year).
An acquaintance with the chief writers and events of the whole period covered by English literature is expected to be secured in the study of this subject.

German, (two years).

First year—The pupil should acquire:

(1) a correct pronunciation, training of the ear, eye and organs of speech.
(2) a vocabulary of a thousand words of every day use; facility in combining these words into simple sentences. (As a means to this, 100 to 150 pages of easy narrative prose and poetry should be read, from which questions and answers may be formed. To test the student's memory and knowledge of the word-order he should relate or write out the story anew in his own words).
(3) From two to three hundred German idioms.
(4) The essentials of German grammar, to be taught by means of oral and written exercises based upon the reading lessons.

Second year—

(1) Read 150 to 200 pages of prose and poetry.
(2) Practice in reading smoothly and with expression.
(3) Carefully translate selected passages of the text into idiomatic English, (to translate easy sentences which the student already understands is a waste of time.
(4) Translate sentences from English into German using words and idioms of the text read.
(5) Study topically German grammar; chief rules of orthography, etymology and syntax; illustrate these by words, phrases and sentences selected or composed by the student.

French, (two years).

The principles of French grammar, including acquaintance with the verb, regular and irregular; an ability to translate easy English sentences into French and simple French prose into English.

History of Greece and Rome, (one-half year).

The history of Greece and Rome should be made a study of the evolution of Greek and Roman institutions. Events should be considered in their bearing on that evolution. Any good outline history will answer as a text-book, but it should be supplemented by other material. It should be noted that a definite portion of the examination will be devoted to geography.

Europe in the Middle Ages, (one-half year.)

The topics to which special attention is called are the disintegration of the Empire of the West, Teutonic settlements and organizations, the Empire of the Franks, the Holy Roman Empire, feudalism, the medieval church, the crusades, the free cities, and the rise of national monarchies.

Modern History, (one-half year).

About half the time should be given to the French Revolution and to the nineteenth century.

English History, (one-half year).

The Saxon period should be passed over rapidly. In the remainder of the work, besides the narrative, constitutional points should receive attention, and easily accesible documents, like Magna Charta, should receive careful study.

Senior American History, (one-half year.)

No attempt should be made to cover the whole field in this time. Either the colonial history or the period from 1783 to 1832 offers quite enough material. In any case considerable use should be made of collections or documents and sources.

Civics, (one-half year).

The subject should be approached from the historical side. The best arrangement is to combine the study with the senior American history and to give a year to the two.

Political Economy, (one-half year).

Some good elementary text book should be mastered. It is desirable that students be encouraged to study local and general economic phenomena and conditions. The time should be wholly devoted to the elements of the science of political economy. The beginner should not be confused with problems of applied economics such as tariff, trusts, bimetallism, etc.

Physics, (one year).

It is suggested that the year's work be confined to four of the seven subjects mentioned below.

1. Mechanics of solids, 2. liquids and gasses, 3. sound, 4. heat, 5. light, 6. and 7. electricity and magnetism (to count as two subjects but not to be divided).

Chemistry, (one or one-half year).

The full year's work should include a study of both the non-metals and metals with laboratory experiments illustrating the common chemical laws and the commoner chemical reactions.

The half year's work should cover the non-metals only, with laboratory experiments similar to the first half of the full year's work.

Botany, (one year or one-halt year).

Schools which give one-half year of botany should devote particular attention to plant relations, making the course largely ecologic in bearing. When a whole year is given to the subject, additional work upon plant structures should be offered, and together with fundamental conceptions of ecology a general idea of morphology and taxonomy should be the aim of the course.

Zoology, (one year).

The course of zoology, whether a half year or a year course, should be a natural history rather than a modern morphological course. Collecting and classifying (as a means) should be encouraged as much as possible. Animals should be studied as living units, in their relation to one another and their environment. The general and special structural features in relation to the habits, the food and manner of obtaining it, the enemies and means of protection against them, hibernation, migration, the differences in habits, form and structure between the old or mature animal and the young, the relation of parents to their offspring, etc.—in short all about the life of the animal under consideration should be the prominent feature, and as much as possible of this should be made out by direct observation of the animal in its natural home and in confinement. The course, on the whole, should aim to foster and develop a love for nature, train the power of observation toward accuracy and give a healthful stimulation to the imagination. The pupil should be guarded against the habit of confounding the facts of observation with his interpetations, his judgments.

The animals for direct observation should be selected from as many branches of the animal kingdom as possible, and the changes during the year in the character of the fauna of the locality in general as well as of some particular region should be noted. In some localities the work will of necessity be largely restricted to land and air animals, but no locality in Minnesota is so poor in animal life that very profitable work cannot be laid out along the line indicated above.

It will be noticed that such a course of necessity includes so-called laboratory work. The amount and extent of the laboratory work will depend upon conditions, but even under the best conditions it is hardly advisable to go into detailed dissections and embryology. Continued, repeated and close observation, aided now and then, by a simple hand lens or a compound microscope, will reveal an abundance of material and opportunity for disciplining the mind.

Astronomy, (one-half year).

An elementary course in general astronomy as presented in any good modern text book.

Geology, (one-half year).

These subdivisions should receive special attention; physiographic geology which treats of the building of the land and the evolution of its existing contours; geo-dynamics, the study of the forces, atmosphere, water, terrestrial heat, plants and animals, modifying the earth; and a brief survey of historical geology.

Physiography, (one-half year).

The following topics should be emphasized: *Meteorology*, to an orderly arrangement of the leading facts relating to the atmosphere, and its phenomena, including some acquaintance with the work of the U. S. Bureau. *Land Sculpture*, as it treats of the origin, development and decadence of land forms and the influence of these processes on the physical environment of man.

Advanced Standing—The University accepts records from all reputable colleges for credit to advanced standing. Such records are accepted so far as they are equivalent to the work done in this University. In bringing records from other institutions, the certificate must be on the official blanks of the institution granting the certificate, and should show:

1. The subject studied; if a language, the work read, etc.
2. The time spent upon each subject.
3. Ground covered in laboratory work in case of laboratory subjects.
4. The result—it is sufficient to state that the subject was creditably completed.

Records from institutions, whose entrance requirements are not essentially equivalent to the requirement of the University, will not be accepted unquestioned; the credit to be allowed will be decided in individual cases by the enrollment committee.

CHOOSING OF COURSES.

The courses of this college are open, free of all charge for instruction, to all persons over fourteen years of age, whether residents of the state or not. Applicants are free to select their course of study at the time of admission, but cannot thereafter change, except when allowed by vote of the faculty.

DAILY ROUTINE.

Monday is taken as a holiday. The morning session begins at 8:30 o'clock; a general assembly of the faculty and students is held each day at 10:25 o'clock, at which there are brief and simple religious exercises.

EXAMINATIONS.

At the close of each term, examinations are held in the studies of the term. In order to be "passed" the student must obtain seventy-five per cent. In determining the standing of a student in any subject the result of his daily work in that subject is combined with the result of the final examination in the ratio of two to one.

Students who pursue any subject unsuccessfully are reported as "incomplete," "conditioned" or "failed." "Incomplete" work must be made up within one term, at the convenience of the professor concerned, or become a "condition," subject to the rule governing conditions. "Conditions" not made up before the subject is offered again become "failures," subject to rule governing failures. "Failures" must be taken over again in class. The examinations for conditioned students are held at the beginning of the fall term in the work of the fall term, at the beginning of the winter term in the work of the winter term, and at the beginning of the spring term in the work of the spring term.

A student who at any time is deficient in more than four studies of four hours per week, loses his class rank and is regarded as a member of the next lower class.

Students whose absences in any term exceed four weeks in the aggregate, are not permitted to take the term examinations without special permission of the faculty.

FAILURE TO KEEP UP WITH THE CLASS.

Any student of the freshman class who receives a "*condition*" *or a* "*failure*" on each of the *four* subjects of the first term, or on *five* of these subjects in the first and second terms, will be dropped from the rolls of the University, and not be allowed to re-enter the University until further preparation has been secured.

FEES.

All students in the college are required to pay an incidental fee of five dollars per term. No reduction is made for late entrance or for leaving before the end of the term. In addition to this fee, students who take work in laboratories are charged a sum sufficient to cover the cost of material and breakage.

GRADUATION.

Students completing courses of study to the satisfaction of the faculty of the college, are entitled to receive the appropriate baccalaureate degrees. Any person may undergo, at suitable times, examination in any subject; and if such person pass in all the studies and exercises of a course, he is entitled to the appropriate degree; **provided,** however, that at least one full year must be spent at the University, before such degrees shall be granted, and **provided,** the examination, in every case, be held before a committee of the faculty appointed for that purpose.

UNCLASSED STUDENTS.

Applicants for admission as unclassed students must present credentials, or pass examinations, entitling them to admission to the freshman class as regular students. It is provided, however, that persons of mature years, who are well prepared for the work they wish to take, may be admitted by a vote of the faculty. Unclassed students who have been previously enrolled must renew their application at the beginning of each year as though applying for the first time. Unclassed students desiring to change their lines of study at the beginning of the second or third terms must again present their application to the committee.

The committee on unclassed students will meet daily during examination (the first) week of the first term in president's office, to consider applications, and all applications must be presented to the committee and not to individual members. Unclassed students will not be admitted after the third week of the term. Action upon applications made after that time will be deferred until the beginning of the following term. Students who are admitted are not allowed to pursue more than two lines of study.

No unclassed student is admitted to the work of the junior or senior year until after a full year's work in the lower classes—but the committee on unclassed students may allow exceptions in case of persons of mature age, upon recommendation of departments concerned.

THE UNIVERSITY SUMMER SCHOOL.

This school will open Monday, July 29th, and continue in session four weeks, closing Friday, August 23d. This school is organized under the authority of the Department of Public Instruction in the interest of the teachers of the State. Instruction is given in two sections.

I. THE UNIVERSITY SECTION,

provides for special and graduate work in university subjects especially for high school teachers. Instruction is given by members of the University faculty or under their supervision, and as the work is completed credit is allowed upon the books of the University. All the advantages of the laboratories, museums and library of the University are open to the classes of this section.

II. THE ELEMENTARY SECTION,

provides for the needs of teachers of the primary and elementary grades. The subjects taught include arithmetic, grammar, history of the United States, physiology, botany, physics, music, penmanship; and special method courses with illustrative lessons.

Circulars of information will be sent free upon application to the registrar of the University.

Unless physics is chosen as the long science, scientific students must elect two sciences (one long and one short) in the freshman year, leaving the language work (other than English or Rhetoric) for the sophomore year. When physics is chosen as the long science, students must choose one science and one language in the freshman year, and in the sophomore year elect another language.

Freshmen shall choose, at the time of registration, between Old English and Rhetoric. Whichever subject is chosen must be pursued throughout the year.

FRESHMAN YEAR.

REQUIRED OF ALL:

1 **English**—Old English **or** Rhetoric.
2 **Mathematics**—I-Higher algebra; II-Trigonometry; III—Analytical geometry.
3 { ***Military Drill** [2]—Required of men.
{ **Physical Culture** [3]-Required of women.
4 **Gymnasium** [1]—Required of men.

In the scientific course students elect one year of language and one long course (two years) and two short courses (one year each) in science. One of the short courses in science must be a physical science. The long course in physics begins in sophomore year and is continued through the junior year.

—ADDITIONAL FOR—

CLASSICAL COURSE.

5 **Greek:**
Courses II, III, IV.

6 **Latin:**
Courses I, II.

NOTES.

All subjects of the freshman and sophomore years, unless otherwise specified, call for four recitation periods per week.

Figures in **bold face type** following a subject indicate the year of the course,—as **1st, 2d, 3d,** etc.

For outline of work covered by the various courses, see department statements, as indicated.

SCIENTIFIC COURSE.

CHOOSE ONE.
Botany:
Long—Course II.
Short—Course I.
Chemistry:
Long—Course I.
Short—Course I.
Zoology:
Course I

6 CHOOSE ONE.
Botany:
Short—Course I.
Chemistry:
Short—Course I.
Zoology:
Course I.
German:
A—Course III. **[3d]**
B—Course I. **[1st]**
French:
A—Course I. **[3d]**
B—Course II. **[1st]**
Latin:
Courses I and II.

LITERARY COURSE.

*5 CHOOSE ONE.
German:
A—Course III. **[3d]**
French:
A—Course I. **[3d]**
Latin:
Courses I and II.

*6 CHOOSE ONE.
German:
A—Course III. **[3d]**
B—Course I. **[1st]**
French:
A—Course I. **[3d]**
B—Course II. **[1st]**

*The languages chosen for the freshman year must be continued through the sophomore year also.

CIVIC COURSE.

5 CHOOSE ONE.
German:
A—Course III. **[3d]**
B—Course I. **[1st]**
French:
A—Course I. **[3d]**
B—Course II. **[1st]**
Latin:
Courses I and II.

6 CHOOSE ONE.
Botany:
Long—Course II.
Short—Course I.
Chemistry:
Long—Course I.
Short—Course I,
Zoology:
Course I.

SOPHOMORE YEAR.

Subjects which in this year are alternatives and which are not elected, may be taken as electives in junior or senior year.

CLASSICAL COURSE.

1 **Greek:**
Courses V, VI, VII.

2 **Latin:**
Courses III, IV, V.

3 CHOOSE ONE
French:
B—Course II. [1st]
German:
B—Course I. [1st]
English:
Course II.
History: Course I,

4 CHOOSE ONE
Botany:
Short—Course I.
Chemistry:
Short—Course I.
Physics:
†*Long*—Course I.
Short—Course III.
Zoology:
Course I.
Mathematics:
Courses IV, V.

5 **Rhetorical Work** [1]

6 ***Military Drill** [2]
Required of men.

SCIENTIFIC COURSE.

1 CHOOSE ONE
Botany:
Long—Course III or IV.
Chemistry:
Long—Course II.
Zoology:
Course II.
Physics:
†*Long*—Course I.
Short—Course III.

SCIENTIFIC COURSE—CONT.

Botany:
Short—Course I.
Chemistry:
Short—Course I.
Zoology:
Course I.
Physics:
Short—Course III.

2 CHOOSE ONE
German:
A—Course IV. [4th]
B—Course I. [1st]
C—Course II. [2d]
French:
A—Course I. [4th]
B—Course II. [1st]
C—Course III. [2d]
Latin:
Courses I, II or III, IV, V.

3 CHOOSE ONE
German:
A—Course IV. [4th]
B—Course I. [1st]
C—Course II. [2d]
French:
A—Course I. [4th]
B—Course II. [1st]
C—Course III. [2d]
Latin:
Courses I. II or III, IV, V.
English:
Course II.

4 CHOOSE ONE
History:
Course I.
Mathematics:
Courses IV, V.

5 **Rhetorical Work** [1]

6 ***Military Drill** [2]
Required of men.

LITERARY COURSE.

Students must continue the two languages chosen in the freshman year through this year also.

1
German:
A—Course IV. [4th]
French:
A—Course I. [4th]
Latin:
Course III, IV, V.

2
German:
A—Course IV. [4th]
C—Course II. [2d]
French:
A—Course I. [4th]
C—Course III. [2d]

3
French:
B—Course II. [1st]
German:
B—Course I. [1st]
English:
Course II.
History:
Course I.

4
Botany:
Short—Course I.
Chemistry:
Short—Course I.
Zoology:
Course I.
Physics:
†*Long*—Course I.
Short—Course III.
Mathematics:
Courses IV, V.

5 **Rhetorcial Work** [1]

6 ***Military Drill** [2]
Required of men.

CIVIC COURSE.

1 **History:**
Course I.

2 **Economics or Politics:**
Economics—I, II, III.
Politics—I, II, III.

3
German:
A—Course IV. [4th]
B—Course I. [1st]
C—Course II. [2d]
French:
A—Course I, [4th]
B—Course II. [1st]
C—Course III. [2d]
Latin:
Courses III, IV, V.
English:
Course II.

4
Botany:
Long—Course III or IV.
Short—Course I.
Chemistry:
Long—Course II.
Short—Course I.
Zoology:
Course I.
Course II.
Physics:
†*Long*—Course I.
Short—Course III.
Mathematics:
Courses IV. V.

5 **Rhetorical Work** [1]

6 ***Military Drill** [2]

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*Military drill is not required during the second term.

†Students who choose this course must continue it through the junior year pursuing course II.

JUNIOR AND SENIOR YEARS.

The work of the junior and senior years is entirely elective, and consists of sixteen exercises or recitations per week, selected from the following lists. Junior and senior electives are interchangeable. The only limitations imposed upon the choosing of subjects are as follows:

(a) Subjects cannot be chosen unless the work leading up to, and preparing for, such subjects has been completed.

(b) Not more than nine twenty-fourths of the work of the two years shall be selected from any one department.

JUNIOR YEAR—FIRST TERM.

Animal Biology [4] (*a*). Course ii—Second half of the long course in zoology.
(*b*) Course v—Histology—course i, prerequisite.

Assyrian—[4]—Grammar and reading of selected texts.

Astronomy [4]—General—Course i.

Botany [4]—(*a*) Plant physiology. (*b*) Plant morphology. (*c*) Elements of archegoniate and metaspermic taxonomy, (*d*) Elements of algology. (*e*) Elements of mycology, (*f*) Plant ecology. (*g*) Cellular morphology and dynamics.

Chemistry [4]—(*a*) Quantitative analysis. (*b*) Organic chemistry.
(*c*) Water analysis.

Comparative Philology [2]—General introduction to the science of language.

Drawing [4]—(*a*) Freehand. (*b*) Antique. (*c*) Design.

Elocution [4]—(*a*) [2] Gesture, voice building, and principles of voice expression.
(*b*) [2] Vocal interpretation of miscellaneous classic literature.

English [4]—(*a*) The Bible as literature. (*b*) Shakspere's predecessors. (*c*) Chaucer.

French [4]—Bronson's Every Day French; translations from English into French; readings from modern authors—Achard, Claretie, Daudet, Hugo.

Geology [4]—Physical geology and geodynamics.

German [4]—(*a*) (Second year of German) Course ii—Modern prose.
b) Faust.

Greek [4]—(*a*) Archæology of Greek art; open to students of all courses.
(*b*) Greek grammar begun.

Hebrew Accidence [4]—With translations from and into Hebrew.

History [4]—(*a*) Course ii—Rise of European nations and the Renaissance.
(*b*) Course iv—France from 1789-1900.
(*c*) Course v—American constitutional history to 1776.

Latin [4]—Roman oratory—Study of growth and characteristics.

Mathematics [4]—Integral calculus.

Mineralogy [4]—(*a*) Course i—General mineralogy; crystallography and the physical character of minerals, with a study of the rock-forming species.
(*b*) Course vi—[1] Outlines of mineralogy,

Pedagogy [4]—Philosophy of education.

Physics [4]—Electricity and magnetism. Open to those who have completed course i.

Political Science [4]—(*a*) Elements of economics.
(*b*)—[4] The science of the state.

Psychology [4]—Of sensation.

Rhetoric [4]—Literary criticism.

Scandinavian (*a*) Language courses for beginners
(1) [4] Swedish.
(2) [4] Danish-Norwegian.

(*b*) Scandinavian literature before 1800.
  (1) [2] History of literature.
  (2) [2] Study of special authors.
(*c*) [4] Scandinavian history before 1500.

Spanish [4]—Hosfeld's Spanish Method; Montilla's libro de lectura iii.

JUNIOR YEAR—SECOND TERM.

Animal Biology [4]—(*a*) Course ii—continued.
(*b*) Course v—continued.

Arabic [4]—Grammar and reading of selected texts.

Astronomy [4]—General—Course i, continued.

Botany [4]—(*a*) Plant physiology. (*b*) Plant morphology. (*c*) Elements of archgoniate and metaspermic taxonomy. (*d*) Elements of algology. (*e*) Elements of mycology. (*f*) Plant ecology. (*g*) Cellular morphology and dynamics. (*h*) Physiology of metabolism and irritability.
A continuation of the work of the previous term.

Chemistry (*a*) [4]—Quantitative analysis. (*b*) Organic chemistry. (*c*) [2]—Theoretical chemistry. (*d*) [4]—Gas analysis.

Comparative Philology [4]—Introduction to Teutonic philology.

Drawing [4]—(*a*) Freehand. (*b*) Antique. (*c*) Design. (*d*) Instrumental.

Elocution [4]—Continuation of work of the first term.

English [4]—(*a*) Shakspere. (*b*) The Romantic Movement.

French [4]—Bronson's Every Day French: Modern authors—Hugo, Mistral, Theuriet, Töpffer; Duval's History of French Literature.

Geology (*a*) [2] Historical. (*b*) [2] Petrographical. (*c*) [2] Paleontological.

German [4] (*a*) Course ii continued—Goethe's Egmont or Schiller's Wilhelm Tell.
(*b*) Lessing's Laocoön and Dramaturgie or Schiller's Wallenstein.

Greek [4]—(*a*) Archæology of Greek art. Open to students of all courses.
(*b*) Grammar continued and Anabasis begun.

Hebrew Accidence [4]—Grammar and reading of selected texts.

History [4]—(*a*) Course ii—continued. (*b*) Course iv—Central Europe in the nineteenth century. (*c*) Course v—American constitutional history from 1776-1816.

Latin [4]—(*a*) History of the early empire. Tacitus, history and annals.

Mathematics—(*a*) [4] Determinants and solid analytical geometry. (*b*) Differential equations. (*c*) [2] Method of least squares. Course (*a*) and (*b*) throughout the junior and senior years are offered alternately in different years.

Mineralogy [4]—Course i—General mineralogy; ores and economic minerals—continued.

Pedagogy [4]—Methodology

Physics [4]—Electricity and magnetism, continued. Open to those who have completed course i.

Political Science—[4] (*a*) Modern Industrialism. (*b*) The science of government.

Psychology [4]—Of knowledge, feeling and will.

Rhetoric [4]—Literary criticism.

Scandinavian (*a*) Language courses for beginners.
  (1) [4] Swedish.
  (2) [4] Danish-Norwegian.
(*b*) Scandinavian literature before 1800.
  (1) [2] History of literature.
  (2) [2] Study of special authors.
(*c*) [4] Scandinavian history before 1500.

Spanish [4]—Continued.

JUNIOR YEAR—THIRD TERM.

Animal Biology [4]—(*a*) Course ii—continued.
(*b*) Course v—continued.

Astronomy (*a*) [4]—General—course i, concluded. (*b*) General—course ii.

Botany [4]—(*a*) Plant physiology. (*b*) Plant morphology. (*c*) The elements of archegoniate and metaspermic taxonomy. (*d*) Elements of algology. (*e*) Elements of mycology. (*f*) Plant ecology. (*g*) Cellular morphology and dynamics. (*h*) Physiology of metabolism and irritability. A continuation of the work of the previous term.

Chemistry (*a*) [4]—Quantitative analysis (volumetric).
(*b*) [2]—Industrial chemistry.
(*c*) [4]—History of chemistry.

Comparative Philology [4]—Comparative phonology of English and German.

Drawing [4]—(*a*) Freehand. (*b*) Antique. (*c*) Design. (*d*) Instrumental.

Elocution [4]—(*a*) Continuation of work of first and second terms.

English [4]—(*a*) Modern English prose. (*b*) xix century essays. (*c*) xviii century prose.

French [4]—History of French literature, the classical period; readings from modern authors—Labiche, Scribe, Merimée.

Geology [4] (*a*) Applied; (*b*) Paleontology; (*c*) Petrography.

German [4]—(*a*) Course ii continued—Lessing's Minna von Barnhelm or Freitag's Die Journalisten.
(*b*) History of German literature; lyric poetry.

Greek [4]—(*a*) Lyric and bucolic poets; collateral reading, theses, dialect, lectures.
(*b*) Anabasis continued.

Hebrew Syntax [4]—Reading of selected portions of the historical books and of the Psalms.

History [4]—(*a*) Course ii—continued. (*b*) Course iv—Europe and Eastern Europe in the nineteenth century. (*c*) Course v—American constitutional history since 1816.

Latin [4]—(*a*) Cicero's correspondence. (*b*) Study of Latin style.

Logic [4] Elementary.

Mathematics [4] (*a*) Solid analytical geometry. (*b*) Differential equations. (*c*) Descriptive geometry.

Mineralogy [4]—(*a*) Course i—Descriptive—continued. (*b*) Course ii—Quantitative mineralogy; the assay of gold and silver ores.

Pedagogy [4]—School organization and administration.

Physics [4]—Light. Open to those who have completed course i.

Political Science [4] (*a*)—Commercial history and commercial documents. (*b*)—Elements of jurisprudence. (*c*)—Advanced economics.

Rhetoric [4]—(*a*) Literary criticism. (*b*) Advanced rhetoric.

Sanitary Science [1]—Open to both juniors and seniors. The subjects are changed alternate years.

Scandinavian (*a*) Language courses for beginners.
  (1) [4] Swedish.
  (2) [4] Danish-Norwegian.
(*b*) Scandinavian literature before 1800.
  (1) [2] History of literature.
  (2) [2] Study of special authors.
(*c*) [4] Scandinavian history before 1500.

Sociology [4]—General.

Spanish [4]—Continued.

SENIOR YEAR—FIRST TERM.

Animal Biology [4]—(*a*) Course vi—Embryology of vertebrates— Course ii or v prerequisite.
(*b*) Course vii—Embryology of invertebrates—Course ii or v prerequisite.
(*c*) Course viii—Taxonomy—Course i prerequisite.

Anatomy [4]—With freshmen in department of medicine.

Astronomy [4]—Practical astronomy. Open to those who have completed the junior astronomy and mathematics.

Botany—For electives in botany, see junior year first term. Open also to seniors.

Chemistry (*a*) [4]—Organic chemistry; lectures and laboratory work. (*b*) [4]—Chemistry of carbohydrates. (*c*) [2] Colloquium.

Comparative Philology [2]—Principles of etymology and semasiology.

Drawing [4]—(*a*) Still life and nature (*b*) Life. (*c*) Modeling.

Elocution [4]—American oratory. Not offered in 1901-02.

English [4]—(*a*) Modern English poetry. (*b*) Beowulf.

French [4]—V. Hugo's Quatre Vingt Treize; lectures and composition on the literature of the xviii century; Howell's farces translated into French.

Geology [4]—(*a*) As in the junior year. (*b*) [1]—Outline of general geology. (*c*) [4]—Paleontology.

German [4]—(*a*) Faust. (*b*) Modern authors.

Greek [4]—(*a*) Tradgy and epic poetry; alternate courses, see Greek course x.
(*b*) Xenophon's Symposium.

History—For electives in history (*a*), (*b*), (*c*), see junior year, first term. In addition:
(*d*) [2] Course vi—Making of the American Constitution.
(*e*) [2] Course vii—American history as seen in development of constitutional law.
(*f*) [2] Course x—Historical masterpieces.
(*g*) [2] Course xii—European diplomatic history.
(*h*) [2] Course xiii Colonial growth and administration.

Latin [4]—(*a*) Lucretius. (*b*) [2] Patristic Latin—Augustine.

Law [4]—This subject counts as a full elective. Students who enter the law college will receive credit for this work. See statement foot of page 43. Not offered in 1901-1902.

Mathematics [4]—(*a*) Modern analytical geometry. (*b*) Theory of equations. (*c*) Descriptive geometry with applications. (*d*) Mechanics.

Mineralogy [4] Course iii—Physico-chemical methods and applications. Micro-chemical methods and determinations.

Oriental History [4]—History of the Hebrews from the earliest times to the fall of Samaria.

Pedagogy [2]—Ancient education.

Philosophy [4]—(*a*) History of philosophy; Greek philosophy; Plato. (*b*) Aesthetics.

Physics [4]—Course iv—Advanced laboratory work. Open to those who have completed course ii.

Political Science [4] (*a*)—Corporation finances. (*b*)—Economic geography.
(*c*)—Taxation. (*d*)—Constitution and government of the United States.

Psychology [4]—(*a*) Advanced original research, course iii. (*b*) Physiological,—study of brain cells and tracts. (*c*) Experimental, course ii. (*d*) [2]—Anthropological.

Rhetoric [4]—Debate.

Scandinavian. Adanced language courses,
(*a*) [4] Danish—Norwegian.
(*b*) [4] Swedish.
(*c*) [4] Icelandic.
(*d*) Scandinavian literature of the xix century.
  (1) [2] History of literature.
  (2) [2] Study of special authors.
(*e*) [4] Modern Scandinavian history.

Spanish [4]—Fiction and drama; Cervantes, Calderon, Lope de Vega and other standard authors.

SENIOR YEAR—SECOND TERM.

Animal Biology [4]—Continuation of the work of the first term.

Anatomy [4]—With freshmen in the department of medicine.

Astronomy [4]—Practical astronomy—a continuation of the work of the previous term.

Botany [4]—See courses of junior year—open to seniors also.

Chemistry (*a*) [2]—Electro-chemical analysis. (*b*) [4]—Analysis of iron.

Drawing [4]—(*a*) Still life and nature. (*b*) Life. (*c*) Modeling.

Elocution [4]—British oratory. Not offered in 1901-02.

English [4]—(*a*) Fiction. (*b*) Old English lyrical and didactic poems.

French [4]—French literature in the xix century; Romantic period; lectures; texts—De Vigny, Hugo, Dumas.

Geology (*a*) As in junior year. (*b*) [4] Economic geology. (*c*) [4] Paleontology.

German [4]—(*a*) Lessing's Laocoön and Dramaturgie or Schiller's Wallenstein. (*b*) Modern German authors.

Greek [4]—(*a*) Neo-Hellenic; grammar, conversation exercises, reading. (*b*) Homer.

History—Continuation of the work of the first term.

Latin [4]—(*a*) Roman satire. (*b*) [2]—Patristic Latin.

Law [4]—The statement concerning law—see first term—will apply to this subject also.

Mathematics [4]—(*a*) Curve tracing. (*b*) Series. (*c*) Mechanics.

Mineralogy [4] Course iv—Optical.

Oriental History [4]—From the fall of Samaria to A. D. 70.

Pedagogy [2]—Medieval and modern education.

Philosophy [4]—(*a*) History of philosophy; medieval and modern philosophy; Hobbs. (*b*) Fundamental problems. (*c*) Ethics.

Physics [4] Course iv—Advanced laboratory work. Open to those who have completed course ii.

Political Science [4] (*a*)—Money and banking. (*b*)—International law. (*c*)—State constitutions and government.

Psychology [4]—(*a*) Experimental, course ii. (*b*) Advanced, course iii. (*c*) [2] Music, course vi.

Rhetoric [4]—Debate.

Scandinavian. A continuation of the work of the first term.

Spanish [4]—A continuation of the work of the first term.

SENIOR YEAR—THIRD YEAR.

Animal Biology [4]—Continuation of the work of the first and second terms.

Anatomy [4]—With the freshmen in the department of medicine.

Aramaic [2]—*Classical*—grammar and translations. *Bibical*—grammar and translations, given alternate years.

Astronomy [4]—Practical astronomy. A continuation of the work of the previous term.

Botany [4]—See courses of the junior year, open to seniors also.

Chemistry (*a*) [4]—Domestic chemistry.
(*b*) [2]—Photographic chemistry.
(*c*) [2]—Micro-chemical analysis.
(*d*) [2]—Colloquium,

Comparative Philology [4]—Comparative grammar of the Greek, Latin and Teutonic languages.

Drawing [4]—(*a*) Still life and nature. (*b*) Life. (*c*) Modeling.

Elocution [4]—Ancient oratory. Not offered in 1901-02.

English [4]—(*a*) Fiction. (*b*) [2]—Anglo-Saxon historical literature. (*c*) Tennyson.

French [4]—Literary schools of the xix century continued. Realism, naturalism, etc.; readings from Sainte Beuve, Taine; the modern drama.

Geology [4]—(*a*) As in the junior year. (*b*) Paleontology. (*c*) Petrography. (*d*) Special problems. (*e*) [2]—Geology of Minnesota. (*f*) [2]—Physiography.

German [4]—(*a*) History of German literature; lyric poetry. (*b*) Modern authors.

Greek [4]—(*a*) Later Greek writers. See course xii. (*b*) Demosthenes.

History—Continuation of work of first and second terms.

Isaiah [2]—A critical study.

Latin [4]—(*a*) Elegiac poetry. (*b*) Ovid.

Law [4]—The statement concerning law—see first term—will apply to this course also.

Mathematics [4]—Mechanics.

Mineralogy [4]—Course v—Crystallography.

Oriental History [4]—Mohammedan history to the end of the crusades.

Pedagogy [2]—School systems.

Philosophy [4]—(*a*) History of philosophy, modern, Kant. (*b*) Philosophy of religion. (*c*) Theory of knowledge.

Physics [4]—Course iv—Advanced laboratory work. Open to those who have completed course ii.

Political Science [4] (*a*)—Transportation. (*b*) City charters and city governments.

Psychology [4]—(*a*) Experimental, course ii. (*b*) Advanced, course iii.

Rhetoric [4]—(*a*) Essays upon art subjects. (*b*) Debate.

Scandinavian. A continuation of the work of the first and second terms.

Spanish [4]—A continuation of the work of the first and second terms.

NOTE—Seniors contemplating entering the medical department are permitted to elect between the two colleges in the courses in *chemistry, histology and physiology* (it being understood that no repetition of work is allowed). The medical department accepts a year's work done in any or all of these three courses, in this college, in lieu of a year's work done in the corresponding courses in the medical department.

NOTE—Members of the senior class of this college are permitted to elect as one subject throughout the senior year, work in the college of law, including the elements of contracts, domestic relations, torts and criminal law. The satisfactory completion of the above named subjects will give the student a senior credit, and will entitle him to admission to the middle class of the college of law. No student will be permitted to take more than one lecture each day in the college of law, without special permission of the faculty of this college.

Courses of Instruction.

ANIMAL BIOLOGY.

Course I. General zoology. "Short course" or first year of the "long course."
Freshman or sophomore i, ii, iii. Professor Sigerfoos

Text-book, lectures and laboratory work.

Course II. Advanced zoology. Second year of the "long course."
Sophomore or junior i, ii, iii. Professor Nachtrieb

Open only to those who have completed course i. In this course the principles and generalizations of zoology will be considered in connection with the related details of structure, development and habits of representative forms of various groups of animals. So far as possible the student will prepare the material himself and thus acquire a practical knowledge of the fundamental methods and technique. Text references: Parker & Haswell's Text book of Zoology; Lang, Text-book of Comparative Anatomy;McMurrich, Invertebrate Morphology;Roule, L'Anatomie Comparee des Animaux; Wiedersheim, Comparative Anatomy of Vertebrates.

Course III. Physiology *Junior or senior i, ii.* Professor Sigerfoos

Martin—The Human Body, as text book; lectures and demonstrations. Open to all. This course will not be offered in 1901-02.

Course IV. Physiology. *Junior or senior iii.* Professor Sigerfoos

Laboratory and reference work. Open to a limited number of those who have satisfactorily completed course iii. Will not be offered in 1901-02.

Course V. Histology Junior i, ii, iii. Professor Nachtrieb and Professor Sigerfoos

Stöhr-Schaper's Text-book of Histology; lectures and laboratory work on the cell, tissues and organs; methods and technique. Open only to those who have completed course i.

Course VI. Embryology of vertebrates. *Junior or senior i, ii, iii.* Professor Nachtrieb

Laboratory and reference work with the ontogeny of some vertebrate as a center, Hertwig-Mark's Text-book of the Embryology of Man and Mammals used as text, Collateral: Marshall's Vertebrate Embryology; Minot's Human Embryology, and Roule's L'Embryologie Comparee. Open only to those who have completed course ii or v.

Course VII. Embryology of invertebrates.
Junior or senior i, ii, iii. Professor Sigerfoos

Laboratory and reference work with the ontogeny of some invertebrate as a center. Text references: Haddon; An Introduction to the Study of Embryology; Korschelt and Heider, Text-book of the Embryology of Invertebrates; Roule, L'Embryologie Comparee. Open to those who have completed course ii or v.

Course VIII. Taxonomy: entomology, ichthyology and ornithology.
Junior or senior i, ii, iii. MR. OESTLUND
Lectures, laboratory and museum work. Open to those who have completed course i.

Course IX. Philosophical zoology. PROFESSOR NACHTRIEB
Occasional lectures upon special topics. Open to those pursuing advanced courses.

FOR GRADUATES.

For graduates of the department and those of equal preparation, whether candidates for an advanced degree in the department or not, any line of research or advanced work that can be carried on profitably.

For less advanced students any regular work of the department for which the applicant is sufficiently prepared.

JOURNAL CLUB.

This club meets once a week throughout the year to listen to abstracts and the discussion of current zoological literature. Attendance is voluntary.

FRIDAY NIGHT READING CLUB.

This club meets once a week during the winter months to read and discuss the philosophical writings of prominent biologists. The membership consists of graduate and other advanced students of the department and the professors and instructors of the various branches of animal biology in the several departments of the University.

ASTRONOMY.

FOR UNDERGRADUATES.

Course I. General astronomy. (Long course). *Junior i, ii, iii.* PROFESSOR LEAVENWORTH
A study of the general principles of astronomy, illustrated by observatory work.

Course II. General astronomy. (Short course). *Junior iii.* PROFESSOR LEAVENWORTH

Course III. Practical astronomy. *Senior i, ii, iii.* PROFESSOR LEAVENWORTH
The theory of instruments, the use of the ephemeris and nautical almanac; the various methods of determining time, latitude, longitude, parallax, the position of the celestial bodies and the method of least squares; observatory practice including photography, and spectrum-analysis. Open to those who have completed course i, and courses i to v, of mathematics.

FOR GRADUATES.

Course IV. Extended course in practical astronomy. PROFESSOR LEAVENWORTH

Course V. Orbit work. PROFESSOR LEAVENWORTH

Course VI. Astrophysics. PROFESSOR LEAVENWORTH

Course VII. Astrophotography with photographic measurements.
PROFESSOR LEAVENWORTH

BOTANY.

Course I. General botany. *i, ii, iii.* MR. LYON
This course comprises a general survey of the plant kingdom with laboratory work on the cell, on algæ, lichens, fungi, mosses and ferns, gymnosperms and flowering plants. Lectures and laboratory.

Course II. General plant morphology. First year. MISS TILDEN
This course comprises a thorough laboratory discipline in algæ, fungi and lichens and is the introductory course for students specializing in botany. Lectures, laboratory work and collateral reading throughout the year.

Course III. General plant morphology. Second year.
PROFESSOR MACMILLAN AND MR. WHEELER
Open to students who have completed course ii, of which it is a continuation. A

view of mossworts, ferns and flowering plants is given, with lectures, laboratory work and collateral reading throughout the year.

**Course IV. General plant physiology.* PROFESSOR MACMILLAN

Lectures, reading and laboratory work. The course embraces about seventy-five qualitative experiments dealing with the principal functions of the plant, and one to three lectures per week. Open as an elective to all students who have followed a course in botany or zoology. Throughout the year.

Course V. Elements of archegoniate and metaspermic taxonomy.
Junior or senior i, ii, and iii. PROFESSOR MACMILLAN AND MR. WHEELER

Lectures, reference reading and herbarium work. The course is primarily designed to afford students an opportunity to become proficient in the determination ot plant species. Open to those whose preparation is deemed adequate.

Course VI. Elements of algology. *Junior or senior i, ii, and iii.* MISS TILDEN

Lectures, laboratory and reference work. The course includes one term's work upon the freshwater algae one upon the brown algae, and one upon the red algae. Its bearing is rather toward comparative morphology than toward taxonomy. Open to those who have completed course i.

Course VII. Elements of mycology. *Junior or senior i, ii, iii.* MR FREEMAN

Laboratory and reference work. The course includes a comparative morphological and taxonomic survey of the fungi with collateral reading in Schroeter, DeBary, Ludwig, Zopf and Brefeld. Open to those who have completed course i.

Course VIII. Plant ecology.
Junior or senior iii. PROFESSOR MACMILLAN AND MR. LYON

Lectures, collateral reading and field observations. The course is designed to cover generally the domain of adaptational adjustments in plant embryology, anatomy, physiology and distribution. Particular attention is devoted to the problems of ecological distribution. Open to those who have completed course i and whose preparation is deemed adequate. Open also as a minor to candidates for the degree of master of science.

Course IX. Cellular morphology and dynamics.
Junior or senior i, ii, iii. PROFESSOR MACMILLAN AND MR. LYON

Laboratory work and collateral reading. The course includes a survey of cell-structure and the various phenomena of division, fusion and metamorphosis, together with a review of the history of cytologic investigation from the time of Malpighi and Grew to the present. Assignments from the work of Strasburger, Henneguy, Hertwig, Wilson, Guignard, Beneden and Driesch will be made and methods of cytological research indicated in the laboratory. Open to those whose preparation is deemed adequate. Open also as a major or minor to candidates for the degree of master of science.

**Course X. Physiology of metabolism and growth.*
Junior or senior i, ii, and iii. PROFESSOR MACMILLAN

Lectures, reading and laboratory work. The course embraces a series of exact determinations of the movements of fluids in absorption, metabolism, excretion and physical processes, the principal constituents of the plant, synthesis of foods, respiration, translocation, enzymatic action, growth and its relation to environmental factors. To follow course iv and open to those eligible to that course. Open as a major to candidates for the degree of master of science.

FOR GRADUATES.

Course XI. Morphology and taxonomy. PROFESSOR MACMILLAN

Special problems in structure, life histories, embryology, classification and phylogeny. Important literature and necessary apparatus will be provided for whatever research is entered upon, under the direction of the department, and the results of the investigation will be required to be prepared for publication. The course is an elastic one and will be adapted to the special training and requirements of those pursuing it. Open as a major or minor to candidates for an advanced degree.

**Course XII. Physiology.* PROFESSOR MACMILLAN

Problems in nutrition and growth. Particular attention is to be paid to the history of related investigations and the development of efficient methods of research in the subject under consideration. The results of the original work accomplished must be presented in a form suitable for publication. Open as a major to those who have completed course iii, to candidates for master of arts or science, and as a major or minor to candidates for doctor of philosophy.

Course XIII. Palaeobotany. DR. SARDESON

Lectures and laboratory work with collateral reading designed to cover the historical literature. Schenck's *Handbuch* will be used as a guide in the laboratory. Open as a partial minor to candidates for the degrees of master of arts or of science.

*Not offered in 1901-02, on account of inadequate laboratory space.

JOURNAL CLUBS.

Journal clubs are held under the direction of Professor MacMillan, and Miss Tilden, at which the attendance of students is required, as may be indicated to them.

CHEMISTRY.

FOR UNDERGRADUATES.

Course I. (*a*) *General chemistry.* *Freshman i.*

Lectures and laboratory work. The course includes a detailed study of the chemical and physical properties of the non-metals and their more important compounds.

(*b*) *Freshman ii,*

Lectures and laboratory work. This course includes a study of the more common metals, their compounds and characteristic reactions.

(*c*) *Freshman iii.*

Lectures and laboratory work. A continuation of course (*b*) with an introduction to organic chemistry.

Course II. Qualitative analysis. *Sophomore i.*

(*a*) Lectures and laboratory work. The course includes the general reactions of the metals and their qualitative separation. Open to those who have completed course i (*c*).

(*b*) *Sophomore ii.*

A continuation of course ii (*a*).

(*c*) *Sophomore iii.*

Lectures and laboratory work. Identification of the acids. Open to those who have completed course i (*b*).

Course III. Quantitative analysis.

Lectures and laboratory work. An introduction to gravimetric analysis and a quantitative separation of the metals. Open to those who have completed course ii.

Course IV. Quantitative analysis.

Continuation of course iii. A completion of gravimetric analysis and an introduction to volumetric analysis.

Course V. Volumetric analysis.

Lectures and laboratory work. A continuation of course iii. Open to those who have completed course iv.

Course VI. Organic chemistry. *Junior i, ii, iii*

Lectures and laboratory work. The course includes the aliphatic series with a preparation of the more important compounds, supplemented by Levy's Anleitung für Darstellung Organischer Präparate. Also the aromatic series with a preparation of some of the more important compounds supplemented by Fischer's Organischer Präparate.

For further elective courses, open to juniors and seniors, see statement under school of chemistry.

COURSES FOR GRADUATE STUDENTS.

1. *Special inorganic chemistry.*
2. *Electro-chemistry.*
3. *Organic chemistry.*
4. *The alkaloids.*
5. *Analytical chemistry.*

COMPARATIVE PHILOLOGY.

PROFESSOR KLAEBER

This department, besides offering courses in the general principles of linguistic science, affords an opportunity for elementary studies in comparative Indo-Germanic philology. The main starting point for the comparative treatment of the Indo-Germanic languages will be the Germanic family; individual old Germanic dialects also will be investigated in detail.

FOR UNDERGRADUATES.

Course I. General introduction to the science of language. Two hours a week.
Junior and senior i

The principles of linguistic growth; the psycho-physical and the historical aspect of language; classification of languages; methods of comparative philology. Lectures and exercises; discussion of standard works, such as Whitney's Language and the Study of Language; Paul's Principien der Sprachgeschichte; Wegener's Grundfragen des Sprachlebens; Jespersen's Progress in Language.

This course will be sufficiently general in its nature to be of use to all students who wish to obtain an insight into the life of language.

Course II. Principles of etymology and semasiology. Two hours a week.
Junior and senior i.

Growth of vocabulary; change of words in form and meaning. Lectures and exercises, with special reference to English and other Teutonic languages.

Course III. Introduction to Teutonic philology. *Junior and senior ii.*

Outlines of the historical and comparative study of the Teutonic languages. The external history and the internal development (phonological, morphological, lexical) of the various branches of the Teutonic group.

Course IV. Comparative phonology of English and German. *Junior and senior iii.*

Elements of phonetics; history of English and German sounds; orthography. The lectures will be supplemented by practical exercises.

Course V. Comparative grammar of the Greek, Latin, and Teutonic languages.
Junior and senior iii.

With a general survey of the field of Indo-Germanic philology.

FOR GRADUATES.

Course VI. Gothic Grammar.

The relation of Gothic to the other Teutonic dialects will be particularly emphasized. Braune's Gotische Grammatik; Heyne's Ulfilas (9th edition); Uhlenbeck's Kurzgefasstes etymologisches Wörterbuch der gotischen Sprache; Paul's Grundriss der germanischen Philologie.

Course VII. Old Saxon.

Grammar and interpretation of the Héliand.

Course VIII. Urgermanische Grammatik.

Relation of the Teutonic to the other Indo-European languages. The Germanic portions of Brugmann's Grundriss der vergleichenden Grammatik der indogermanischen Sprachen; Kluge's Vorgeschichte der altgermanischen Dialekte; Noreen's Abriss der urgermanischen Lautlehre; Streitberg's Urgermanische Grammatik; etc.

Course IX. Old High German.

Braune's Althochdeutsche Grammatik; Braune's Althochdeutsches Lesebuch

See also under "German Department."

N. B. The undergraduate courses are open to graduate students subject to the rules of the Graduate Department.

Related courses will be found under English.

DRAWING.

Course I. Drawing. *Junior i, ii, iii.*

From models, casts and nature. Study of the principles of perspective and light and shade. In charcoal, line, and wash.

Course II. Antique. *Junior and senior i, ii, iii.*

Studies of the human figure, from casts, in charcoal. Fractions, torsi, masks, busts, statues and groups.

Course III. Design. *Junior or senior i, ii, iii.*

The anatomy of pattern and geometrical design, planning of ornament, color harmony, plant analysis and conventionalism, traditional ornament and animate forms.

Course IV. Instrumental. *Junior ii, iii.*

Problems, projections, sections, developments and interpenetrations. With conventional renderings in line and wash.

Course V. Still life and nature. *Senior i, ii, iii.*

Studies of groups of still life and plants and flowers. In pen and ink or water color or oil. Open to those who have taken course i or course ii.

Course VI. Life. *Senior i, ii, iii.*

Studies in charcoal from the living model (heads and figures with costumes). Sketches in pencil, charcoal, red chalk and pen and ink. Open to those who have taken course i or course ii.

Course VII. Modeling. *Senior i, ii, iii.*

In clay, from the antique, and casting in plaster.

ENGLISH LANGUAGE AND LITERATURE.

Course I. Old and Middle English

Freshman, i, ii and iii MRS. POTTER AND MISS POTTER

This will consist of the elements of old English grammar, reading of old and middle English texts, and lectures upon the history of the language and literature.

The object of this course is to prepare the student for an intelligent study of modern English literature. Hence constant emphasis is laid upon the relation of old to modern English,

This course is also open as an elective to sophomores, juniors, seniors and graduates who have not already completed the work.

Course II. The scientific movement. *Sophomore i.* MRS. POTTER

This course will take up the study of Darwin, Tyndall, Huxley Spencer and other well known scientists, from a literary point of view.

(*b*) *Spenser.* *Sophomore ii.*

(*c*) *Milton.* *Sophomore iii.*

Open also as an elective to juniors and seniors.

Course III. (*a*) *Chaucer.* *Junior i.* ASSISTANT PROFESSOR McCLUMPHA

Critical studies in the Canterbury Tales and minor poems.

(*b*) *Shakspere.* *Junior ii.*

Four plays will be studied: Love's Labor Lost Twelfth Night Antony and Cleopatra, and Cymbeline.

(*c*) *XVIII century English prose.* *Junior iii.*

A study of the essayists and novelists of the XVIII century. Open also as an elective to juniors and seniors.

Course IV. *Shakspere's predecessors.* *Junior or senior i.* ASSISTANT PROFESSOR McCLUMPHA

This includes the pre-Shaksperean drama, Spenser's Faerie Queene, and the Elizabethan lyrics.

Course V. *The romantic movement.* *Junior or senior ii.* ASSISTANT PROFESSOR McCLUMPHA

A study of Wordsworth, Coleridge, Keats, and Shelley.

Course VI. *XIX century essays.* *Junior or senior iii.* ASSISTANT PROFESSOR McCLUMPHA

Prose works of Lamb, DeQuincy, Macaulay, Carlyle, Arnold and Ruskin studied.

Course VII. *Tennyson.* *Junior or senior iii.* ASSISTANT PROFESSOR McCLUMPHA

A study of Tennyson and the later Victorian poets.

Course VIII. *Advanced work in English philology.* PROFESSOR KLAEBER

(*a*) *Beowulf.* *Senior i.*

(*b*) *Old English lyrical and didactic poems* *Senior ii.*

(*c*) *Anglo-Saxon historical literature.* (Two hours a week.) *Senior iii.*

Course IX. *Modern English poetry.* *Junior and senior i.* PROFESSOR BURTON

A study of Shelley, Keats, Wordsworth, Browning, Tennyson and Swinburne.

Course X. *The Bible as literature.* *Junior and senior i.* PROFESSOR BURTON

A study of the literary forms and values found in the Old Testament writings.

Course XI. *Shakspere.* *Junior and senior ii.* PROFESSOR BURTON

A study of representative plays (changed from year to year.)

Course XII. *Fiction.* *Junior and senior ii and iii.* PROFESSOR BURTON

A study on alternate years of the modern romance and the modern novel of realism.

Course XIII. *Modern English prose.* *Junior and senior iii.* PROFESSOR BURTON

A study of the present literary vernacular in its best examples.

FOR GRADUATES.

Graduate courses offered by PROFESSOR BURTON.

The essay as an English literary form.
The drama as technic.
The history and practice of journalism. This course for 1901-02.
(These are alternates.)

A senior seminar is also conducted in the pre-Raphaelite poets.

The junior-senior courses are open to graduate students under the rules of the graduate department.

The following graduate courses are offered by ASSISTANT PROFESSOR McCLUMPHA.

XVIII century English fiction.
The dramatic works of Ben Johnson.

The following graduate courses are offered by PROFESSOR KLAEBER.

Introduction to the middle English grammar, with reading of select texts.

Critical reading of difficult Old English texts.

Research work in old English literature.

N. B. The undergraduate courses in English philology are open to graduate students, subject to the rules of the graduate department.

FRENCH.

FOR UNDERGRADUATES.

Course I. Advanced grammar and composition.

Freshman i, ii, and iii, and sophomore i, ii, and iii.

Mera's Syntax Pratique de la Langue Francaise; Paul Bercy's Selections for Translating English into French. The classical authors of the XVII and XVIII centuries will be read. Fortier's Histoire de la Litterature Francaise will be read. Open to freshman who have completed the French required for entrance.

Course II. French begun. *Freshman or sophomore i, ii, and iii.*

De Borde's Elements of French; Kuhn's French Reader; modern plays.

Course III. (*a*) *Bronson's Every Day French.* *Sophomore or junior*

Translations from English into French—modern authors; Achard, Claretie, Daudet, Hugo.

(*b*) *History of French literature up to the classical period.* *Sophomore or junior ii.*

The modern drama; plays from Labiche, Madame de Girardin, Scribe, &c.

(*c*) *The classical literature of France.* *Sophomore or junior iii.*

Corneille Racine, Molière.

Course IV. Lectures on the literature of the xviii century. *Senior i.*

With a view to the causes of the French Revolution. Howell's farce—The Albany Depot, translated into French. De Vigny's Cannede Jonc, V. Hugo's Quatre Vingt Treize and Hernani.

(*b*) *The xix century in France.* *Senior ii.*

The romantic movement, lectures; Howell's farce—Five O'Clock Tea, translated into French; Texts: Dumas, Balzac, Daudet.

(*c*) *The later literary schools of the xix century.* *Senior iii.*

Realism, naturalism; lectures; Texts: plays by Angier, Scribe, Rostand.

Course V. Italian. *Senior i, ii, iii.*

Ahn's Italian course. Goldoni, Tasso, Petrarch, &c. (Once a week.)

Course VI. (*a*) *Spanish begun.* *Junior i, ii, iii.*

Spanish grammar, Hosfeld's method; Montilla's libro de lectura III.

(*b*) *Second year.* *Senior i, ii, iii.*

Spanish fiction and drama; Cervantes, Calderon, Lope de Vega, and other standard authors.

FOR GRADUATES.

Course VIII. Romance languages. Old French.

Origines de langue Française par Petit de Julleville. Morceaux Choisis des Auteurs Français du Moyen Age, par L Clédat. Some of the oldest monuments of the French language interpreted and translated into modern French, such as Serments de Strasbourg; La Vie de Saint Alexis; La Cantilene d'Eulalie; the chronicles of Villehardouin, La Chanson de Roland, Froissart, Phonetic changes studied and their laws examined. Special attention is given to those forms which have entered into the English language. This course is especially valuable to students in English philology.

Course IX. History of the novel in the xix century.

Course X. Italian. Interpretation of Dan e's Inferno.

Course XI. Old Spanish. El Poema del Cid

GEOLOGY.

FOR UNDERGRADUATES.

Course I, Physical geology. *Junior or senior i.* PROFESSOR HALL

1, Geodynamics, discussing the atmosphere, water, terrestrial heat, plants and animals, as geologic agents; 2, structural geology, explaining stratification, displacements, dislocations, fractures, induced rock-structures and mineral veins in their relations to the arrangement of material in the earth; 3, physiographic geology, pointing out the more prominent earth features and discussing their origin, significance and the agencies affecting them; 4, an enumeration of the common rock making minerals in their formation, occurrence and alterations.

Course II. Historical geology. *Junior or senior ii.* PROFESSOR HALL AND MR. UPHAM

A study of the strata of the earth. An outline of the salient features of the earth's history, discussing its several eras with their faunas and floras. The special purpose of the course is to outline the geographical history of the North American continent. Lectures and reading, twice a week.

Course I and II supplemented by either III or IV are intended primarily for students not intending to specialize in geology.

Course III. Petrographical geology. *Junior or senior ii.* DR. BERKEY

General considerations on the origin and occurrence of rocks; i. e. Petrogenesis. The structure and texture of rocks. Preliminary studies of the mineral, physical and chemical constitution of the crystalline rocks with a view to their general description. Kemps Handbook of Rocks. Reference reading and demonstrations. Twice a week.

Course IV. Paleontological geology. *Junior or senior ii.* DR. SARDESON

A study of the more important types of fossils in their geological relations. Lectures and laboratory. Twice a week. Open to those who have completed course i or course xi.

Course V. Applied geology. *Junior or senior iii.* PROFESSOR HALL

An outline of the economic relations of geology. The course comprises a discussion of the nature and distribution of the non-metallic materials of an economic value, including coal, mineral oils and natural gas; phosphates and other natural fertilizers, together with soils; the geologic conditions of water supply; abrasive and fictile materials; natural and artificial building stones; mortars and cements for construction, road-making, followed by a brief summary of the nature and distribution of ore deposits of the less and more important metals. Williams Applied Geology and reference reading.

Course VI. Petrography. *Senior iii.* PROFESSOR HALL

An investigation of the megascopic and microscopic characters of crystalline rocks; a discussion of their crystalline habit, mineral composition and genetic relations. The course extends into an examination of some Minnesota groups of crystalline rocks. Practically a continuation of course iii. Laboratory, with lectures and reference reading.

Course VII. Paleontology. *Junior or senior iii.* DR. SARDESON

The course treats of paleontological evidence, its sources and interpretation and its relation to the theory of evolution. Lectures and demonstrations. Occasional expeditions can be arranged. Open to students of geology and biology, *Course VIII. Paleontology.* *Senior i, ii. iii.* DR. SARDESON

The several chief types of organisms as represented by fossils will be studied successively. The leading fossils and their phylogenetic history will be treated with considerable detail. Lectures and demonstrations. Open to students of geology and biology.

Course IX. Economic geology. *Senior ii.* PROFESSOR HALL

History of mineral discovery and development in the Americas; a discussion of the origin and distribution of ore deposits, embracing the chemical processes involved in their formation and subsequent alterations; a description of the geology and mineralogy of ore bodies, particularly those yielding gold, silver, copper, iron, lead and zinc.

Course X. Special problems. *Senior iii.* PROFESSOR HALL

The investigation by individual students of particular problems, involving the field work of an investigation of some particular formation and with the laboratory investigation and reading incident to the study of the material collected, The methods of systematically recording and interpreting geological and mineralogical data as observed in the field; the keeping of note-books, preparation of geological mass, profiles and sections will be taught.

Course XI. An outline of general geology. [1] *Junior or senior i.* PROFESSOR HALL

This course treats of the leading physiographic facts and principles; the microscopic characters of the common rocks and a discussion of the general principles of petrographical and stratigraphical geology. Sections and reading supplemented by excursions and practical problems.

Course XII. Geology of Minnesota. [2] *Junior or senior iii.* PROFESSOR HALL

An outline of physiographic features; a review of the geography, petrology, paleontology and stratigraphy of the rocks of the several periods of geologic history embraced within the State; a discussion of the material resources of Minnesota, particularly in building stones and metallic products.

Students desiring courses ix or x must take courses preparatory to the same in junior year.

FOR GRADUATES.

Course XIII. Petrographical problems. PROFESSOR HALL

A study of rocks as geological bodies; the genesis of rocks and their chemical and dynamical alterations, illustrated in the gneisses and gabbro schists of the Minnesota river valley or the granites and basic eruptives of central Minnesota.

Course XIV. The Keweenawan eruptives PROFESSOR HALL

of eastern and northeastern Minnesota; their stratigraphic relations, textural and structural characters; or other problems to be selected on consultation.

Course XV. Glacial geology. PROFESSOR HALL

The local features of glacial phenomena. Field work will form the special feature of this course embracing the formations at Minneapolis or some area accessible from it, as a survey of the glacial lakes in the vicinity, the gorge below the Falls of Saint Anthony, the Dales of the St. Croix and other problems. The special field to be selected on consultation.

Course XVI, Paleontologic geology, DR. SARDESON

A study of the Ordovician fauna with special illustrations from the Ordovician of Minnesota and neighboring states.

Course XVII. Paleontology. DR. SARDESON

The study of a selected group of fossils; a practical acquaintance with the forms and literature of the group is sought. The course is to be supplemented by a thesis.

GERMAN.

FOR UNDERGRADUATES.

Students who begin German in the University will take the courses in the following order: courses I, II, V, VI.

Students who have presented German for admission will elect in this order: courses III, IV, V, VI.

Course I. German begun. *Freshman and sophomore i, ii, iii.*
ASSISTANT PROFESSOR WILKIN, MR. SCHLENKER AND DR. SCHULZ.

(*a*) *All courses.* Whitney's Brief German Grammar and Bernhardt's German Composition.

(*c*) *All courses.* Grammar and composition continued.

(*c*) [*Cl. lit and civ.*] German prose selections:—Leander's, Traümereien, Heyse's L'Arrabbiata, and Von Hillern's Höher als die Kirche.

Grammar and composition concluded.

(*c*) [*Sci. and eng.*] Scientific prose: Gore's German Science Reader. Grammar and composition concluded.

Course II. German, second year.
Sophomore and junior i, ii, iii. MR. SCHLENKER and DR. SCHULZ.

(*a*) *Modern prose.* Francois' Phophorus Hollunder and Rosegger's Waldheimat. Grammar reviewed. Stein's German Composition.

(*b*) *Goethe's Egmont:* Sketch of Goethe's life and works; or Schiller's Wilhelm Tell; sketch of Schiller's life and works.

Grammar reviewed and composition continued.

(*c*) *Lessing's Minna von Barnhelm:* Sketch of Lessing's life and works; or Freitag's Die Journalisten; sketch of Freitag's life and works. Composition concluded. Practice in speaking and writing throughout the year.

Course III. Classic prose and poetry. *Freshman and sophomore i, ii, iii.*
PROFESSOR MOORE, ASSISTANT PROFESSOR WILKIN AND DR. SCHULZ.

(*a*) [*All courses.*] *Historical prose.* Schiller's Thirty Years War or Egmont's Leben und Tod, and Gedichte. Schiller's life and works.

Writing from dictation; oral and written work based on the text. Dr. Lyon's Deutsche Grammatik.

(*b*) [*Cl. lit. and civ.*] *Goethe's Italienische Reise and Gedichte.* Gœthe's life and works. Dictation; oral and written exercises continued. Grammar continued.

(*b*) [*Sci. and engin.*] *Hodge's Course in Scientific German.* Dictation; oral and written exercises continued. Grammar continued.

(*c*) [*Cl. lit. and civ.*] *Heine's Harzreise and Buch der Lieder.* Heine's life and works. Original letters, notes and essays. Grammar completed.

(*c*) [*Sci. and engin.*] *Hodge's Course in Scientific German.*—Continued. Original letters, notes and essays. Grammar completed.

Course IV. Drama. *Sophomore i, ii, iii.* MR. SCHLENKER

(*a*) *Modern Drama.* Grillparzer's Sappho or Wilbrandt's Meister von Palmyra. Composition. Letter writing. Essays and oral exercises on descriptive subjects.

(*b*) *Goethe:* life and works. Iphigenie or Tasso.
Composition continued. Essays and oral exercises on narrative subjects.

(*c*) *Lessing:* Nathan or Emilia Galotti; life and works. Composition. Essays and oral exercises on argumentative subjects.

Course V. Advanced subjects in literature and criticism.
Junior and senior i, ii, iii. PROFESSOR MOORE.

(*a*) *Goethe's Faust:* history of its composition. Faust legend; its treatment in literature before and since Goethe's time. The plan of Goethe's Faust; change in the order of the scenes; solution of the Faust problem in Part II. Lectures; essays by the class on related subjects.

(*b*) *Lessing's Laocoon* (25 chapters) and selections from his Dramaturgie. Lessing's study of Sophocles, Aristotle and Shakspere; application of his conclusions in the dramas Philotas, Minna von Barnhelm, and Emilia Galotti. Nathan der Weise, its ethical significance; theological writings. Lectures and theses by the class.

Schiller's Wallenstein. Selections from critical essays.

(*c*) *German lyrical poetry* from Luther to Goethe. Outline of the history of German literature since the Reformation.

For those who have completed course ii or iv.

Course VI. German literature since the death of Goethe. PROFESSOR MOORE
Rapid reading of recent authors. For those who have completed course v.

FOR GRADUATES.

Course VII. Life and works of Luther. PROFESSOR MOORE

Course VIII. Old High German, PROFESSOR KLAEBER
Braune's Althochdeutsche Gramatik; Braune's Althochdeutsches Lesebuch.

Course IX. Seminar. PROFESSOR MOORE
Goethe's Faust, Part II.

Course X. Teacher's seminar. PROFESSOR MOORE
Historical German grammar. Methods of modern language instruction.

Course XI. H. Helmholtz: DR. SCHULZ
Ueber die Erhaltung der Kraft. G. Kirchhoff und K. Kunsen: Chemische Analyse durch Spectralheobachtungen. 1901-02.

Course XII. O. Me und F. Langhoff: DR. SCHULZ
Warum and Weil. Zoologie and Botanik,

GREEK.

FOR UNDERGRADUATES.

Course I. (*a*) *Greek Grammar.* *Junior i.*
Brooks' Introduction to Attic Greek.

(*b*) *Greek Grammar and Anabasis.* *Junior ii.*
Brooks' Introduction completed and Anabasis begun.

(*c*) *Anabasis continued.* *Junior iii.*

Course I is open to students in the scientific, literary and civic courses. Those students entering the University who have not had the opportunity of pursuing Greek in preparatory schools and desire to take the classical course are also admitted to these courses, but in their case, the work if successfully accomplished, will be counted as removing in part the entrance conditions in Greek.

Course II. Xenophon's Symposium. *Freshman i, senior i.*
Smith's History of Greece, Book IV: Grote's History of Greece, chapters 48 to 66; Greek prose composition; reading at sight.

Course III. Lysias. *Freshman ii.*
Smith's History, Book V; Grote's History, chapters 72 to 85; Greek prose composition; reading at sight.

Course IV. Demosthenes. *Freshman iii, senior iii.*
Smith's History, Book VI; Grote's History, chapters 86 to 95.

Course V. Plato. *Sophomore i.*
Collateral reading; thesis; reading at sight.

Course VI. Homer. *Sophomore ii, senior ii.*
Smith's History Introduction and Books I and II; Grote's History Part I; reading at sight.

Course VII. Tragedy. *Sophomore iii.*
Collateral reading; theses.

Courses II, IV and VI, are open to students in scientific, literary and civic courses who have taken course i.

Course VIII. Archaeology of Greek art. *Junior i and ii.*
Collateral reading; theses; lectures. Open to students in all courses.

Course IX. Lyric and bucolic poetry. *Junior iii.*
Collateral reading; study of dialects; theses; lectures.

Course X. Tragedy and epic poetry. *Senior i.*

(*a*) The trilogy of Aeschylus.

(*b*) Oedipus Tyrannus; Oedipus Coloneus; Antigone.

(*c*) The Choephorae of Aeschylus; the Electra of Sophocles; the Electra of Euripides.

(*d*) The Odyssey.

Collateral reading; theses; lectures on epic poetry and the drama.

Course XI. Neo-Hellenic. *Senior ii.*
Collateral reading; theses; composition.

Course XII. Later Greek writings. *Senior iii.*
Selections from Polybius, Plutarch, Arrian, the Septuagint and the New Testament.

Course XIII. Seminar in Greek poetry or Epigraphy, *Senior i, ii, iii.*
One hour per week.

Course XIV. Institutions and life of the Greeks. *Junior ii.*
Collateral reading; lectures; theses.

GRADUATE COURSES.

Course XV. (*a*) *Greek poetry, epic, lyric, dramatic, bucolic*, with critical reading of authors,

(*b*) *Greek oratory*, and history with critical reading of authors.

(*c*) *Epigraphy.*

HISTORY.

Course I. English constitutional history, with brief survey of continental history.
Sophomore i, ii, iii. ASSISTANT PROFESSORS ANDERSON AND WHITE, AND MISS BEACH

Required of civic students in the sophomore year, and may be taken as an alternative by sophomores in other courses, or as an elective in the junior or senior year. Required for admission to all other courses of history.

This course includes a general view of the salient features of European history from the fourth to the eighteenth century, with a detailed study of the development of the English constitution.

First term—General history of Western Europe from the barbarian invasions to the territorial formation of the leading European states.

Second term—English constitutional history from the Norman Conquest to the Tudor period.

Third term—English constitutional history from the accession of the Tudors to the House of Hanover. In connection with the study of this period some consideration will be given to international relations, the Continental Reformation, the Counter Reformation, and the Thirty Years' War.

Course II. European history, 10th century—1648.
Junior or senior i, ii, iii. ASSISTANT PROFESSOR WHITE

First term—History of the German Empire from the 10th century to the Reformation. A careful study is made of the German government, especially the effect upon it of the Papal-Italian connection, the main theme of the term being the conflict of the Empire and the Papacy.

Second term—History of France from Hugh Capet to Charles VIII. The theme of the term is the growth of the French nation, care being taken to contrast the governmental development of France with that of Germany. Important collateral themes studied are feudalism and the crusades.

Third term—The Renaissance and Reformation are studied as general European movements. Some use will be made of the sources, and, as far as possible, a first-hand knowledge gained of these movements and their leaders. The history of Europe from the middle of the 16th century to the peace of Westphalia is then covered briefly.

A thesis on some important topic connected with the term's work is required in each of the first two terms. In the third term the preparation of several short themes takes the place of this.

A reading knowledge of French, German, or Latin, while not required in this course, is an advantage.

Course III. Scotch and Irish history—political and economic.

Junior or senior i, ii. iii. ASSISTANT PROFESSOR WHITE

This course will not be given in 1901-1902.

Course IV. Europe since 1789.

Junior or senior i, ii, iii. ASSISTANT PROFESSOR ANDERSON

Open to those who have completed course i. The chief aim of the course is to put the student into appreciative contact with immediately contemporary history. Much of the work is done from periodicals, annual registers, year books and the like. The arrangement of the work by terms is as follows:

First term—Europe during the Revolutionary and Napoleonic periods (1789-1815).

The first three or four weeks are devoted to a study of the political, economic and social condition of Europe on the eve of the French Revolution; the remainder of the term is about equally divided between the Revolutionary and Napoleonic periods. Students are required to have Gardiner's *French Revolution.*

Second term. Western Europe since 1815.

The greater part of the time is given to France and Great Britian; the smaller western states are passed over rapidly, but time is taken for a careful study of the constitutions of Switzerland and the Scandinavian states. Students are required to have for this and the following term *Seignobos's Political History of Europe since 1814* and Lowell's *Government and Parties of Continental Europe.*

Third term—Central and Eastern Europe since 1815.

Particular attention is given to the unification of Germany and Italy, the transformation of Austria-Hungary into a constitutional state, the transformation of Russia following the Crimean War, the rise of the Christian states in the Balkan Peninsula, and Russian expansion in Asia.

Course V. Constitutional history of the United States.

Junior or senior i. ii, iii. PROFESSOR WEST

Open to those who have completed course i, and required for courses vi-ix.

The aim is to make this a "practice course;" the work is done partly by co-operative topical reports, and students are expected to consult primary sources to a greater degree than is possible in most undergraduate courses.

First term—Colonial: the development of selected European germs in an American environment, the divergence from the European types, and the final separation in the Revolution. The topics given most attention are the development of representative government in the different colonies, especially in New England; the effects of the Stuart restoration and the critical colonial period, 1660-1689: the character of French colonization and the cause of the failure of France in the struggle for the new world; the constitutional struggle preceding the Revolution and the progressive American standard of political rights.

Second term—The formation and organization of the Union: the transition from colonial to commonwealth governments; the central government under the confederation; the making of the constitution; the organization of the Federalists and the centralizing tendencies they set in motion; the victory of Jeffersonian democracy and the modification of Jeffersonianism in the war of 1812.

Third term—The growth of nationality: social and economic conditions in 1800; territorial expansion; the frontier and its meaning; Jacksonian democracy; the slavery struggle; civil war and reconstruction: economic development and questions.

Course VI. The making of the constitution of the United States. PROFESSOR WEST

An intensive course two hours a week, open to seniors who have taken course v with distinction, and to graduates. Each member of the class studies in detail the transition in one of the original colonies to commonwealth government, with the constitution of his chosen state. The work of the Philadelphia convention is then taken up and the accounts of later writers are compared with the sources. "We the people", the "compact" theory, and the province of the supreme court as "final arbiter," are topics especially investigated, with such further aids as the writings of the day and the discussions of the ratifying state convensions afford. Besides the class work each student will present a written report upon the history of some important bill providing for the admission of a state, and some constitutional question in connection with congressional legislation. This course will be given in 1901-1902, but not in 1902-1903.

Course VII. American history since 1789 as shown in the development of constituional law. PROFESSOR WEST

An intensive course, two hours a week, open to seniors who completed course V, to graduates, and to qualified law students. Course VI also is a desirable preparation. The two courses, VI and VII, are given in alternate years. Course VII will not be given in 1901-1902. This course is not designed to be a systematic treatment of either history or constitutional law. It consists of a careful analysis of cases selected from Thayer's Cases on Constitutional Law, studied in their historical setting and with reference to the course of development.

Course VIII. Constitutional history during the Civil War and Reconstruction period PROFESSOR WEST

Open on the same terms as VI and VII. Two hours a week. Not given in 1901-1902.

Course IX. Studies in American biography. ASSISTANT PROFESSOR ANDERSON

Two hours a week through the year. Open to seniors who have completed course v and to graduates.

In this course the work will each year center about the political activity of a single important character. In the choice of a subject two points will be especially borne in mind.

1. To select a character not only important *per se* but representative of some great historical movement or idea.
2. To select one who has left an abundance of material, valuable not only for his own part but throwing light upon the action of others.

It is the aim to give each member of the class an opportunity to work up carefully topical divisions of the field and an acquaintance with the entire body of writings relating to the subject somewhat more special than can be secured in the general courses. The subject for 1902-1903 will be John Quincy Adams or James Madison as may be most acceptable to students desiring the course. Not offered in 1901-1902.

Course X. A critical study of historical masterpieces. ASSISTANT PROFESSOR ANDERSON

Open to seniors who have taken two courses in history, and to graduates. Two hours per week through the year. Courses ix and x are given in alternate years.

The object of this course is to develop the habit of reading history critically, Each year a masterpiece of historical literature will be minutely and critically studied. Every student will be required to read critically the entire work studied and in addition, to analyze and report upon assigned portions of it. These reports will be made the basis of the class work, which will consist mainly of discussions carried on by the students under the direction of the instructor. The work selected for the year 1901-1902, is *Henry Adams' History of the United States.*

Course XI. The history of American diplomacy. ASSISTANT PROFESSOR ANDERSON

Offered to seniors and graduate students who have had two courses in history or one in history and one in international law. History v is the best preparation. The course is designed to afford instruction upon the following matters: (1) The organization and methods of the diplomatic corps. (2) The history of the most important diplomatic negotiations. (3) The effect of the foreign policy upon the internal affairs of the country. Not given until 1902-03. To alternate with course xii.

Course XII. The history of European diplomacy 1814-1878.
ASSISTANT PROFESSOR ANDERSON

Offered to seniors and graduate students who have had two courses in history or one in history and one in international law. History iv is the best preparation. Students will have Debidom's *Historie Diplomatique de l' Europe, 1814-1878*, second edition. Ability to read French is required. Given in 1901-1902, but not in 1902-1903.

Course XIII. Colonial expansion and system of administration. PROFESSOR WEST

Two hours a week; open to students who have completed course iv or v. The history of the colonial acquisitions of the great nations will be surveyed rapidly, and colonial institutions and governments will be studied and compared in detail.

Course XIV. A critical study of authorities for early New England history—based upon a reading of Winthrop's New England. PROFESSOR WEST

Two hours a week; open to graduates only. This is primarily a course in historical criticism. Each member of the seminar has a group of secondary authorities assigned him whom he is to criticise in the light of the original sources. The study involves also a careful comparison of the chief sources with each other, and incidentally it leads to a minute treatment of political, social and economic development in early New England. The number admitted to the course is strictly limited to six. Offered in 1901-1902.

Course XV. A seminar upon the teaching of history in secondary schools.
PROFESSOR WEST

Not given in 1901-1902.

Course XVI. A history of the "Philosophy of History." PROFESSOR WEST

Two hours a week; open to graduates; given in alternate years with course xv.

Course XVII. Interpretation of medieval economic documents.
ASSISTANT PROFESSOR WHITE

Characteristic documents relating mainly to 12th and 13th century economic history are to be carefully studied with reference both to language difficulties and historical criticism. Such documents will be selected as will tend to throw the most light on the leading economic problems of the medieval period. The work is to be based on *Documents Relatifs a L' Histoire de L' Industrie et du Commerce en France*, edited by Faguiez.

Course XVIII. English constitutional history. ASSISTANT PROFESSOR WHITE

One meeting a week through the year. Critical and detailed study of the reigns of Henry III and Edward I, with special attention to the establishment of the great Charter and the evolution of Parliament, Based on a careful reading of Bracton and the chronicles of Matthew Paris and William Rishanger, A working knowledge of Latin is required. Courses xi and xii are not given in the same year.

LATIN.

Course I. Livy. *Freshman i, ii*

Books i, xxi and xxii or an equivalent, comprising:
(*a*) An idiomatic translation; with exercises in sight translation; (*b*) Construction of the Latin sentence; (*c*) Latin composition; (*d*) Rise and development of Roman institutions.

Course II. Literature. *Freshman iii*

Study of the rise and development of Roman literature with reading of portions of the text of different authors.

Course III. Plautus and Terence. *Sophomore i*

Three plays. Rise and development of the Latin drama.

Course IV. Horace. *Sophomore ii*

Selections from his odes, epodes, satires; study of life, times, style and works.

Course V. Tacitus and Pliny. *Sophomore iii*

Germania and Agricola. Selections from letters of Pliny the younger.

Course VI. Roman oratory. *Junior i.* PROFESSOR PIKE

(*a*) History of Roman oratory; text, Kellog's Brutus of Cicero; (*b*) Theory of Roman oratory; text, De Oratore of Cicero, book i; a sketch of ancient rhetoric.

Course VII. History of the early empire. *Junior ii.* PROFESSOR PIKE

Selections from the annals of Tacitus illustrating the civil life and political history of the period from Augustus to Nero Texts. Allen's first six books of Annals, Teubner's text and Cape's Early Empire.

Course VIII. Cicero's correspondence. *Junior iii.* PROFESSOR PIKE

A study of the life and times of Cicero from his correspondence. Text: Abbot's Cicero's Letters. Not offered in 1901-02.

Course IX. Study of Latin style. *Junior iii.* PROFESSOR PIKE

Translation of extended pieces of English prose into Latin. Latin composition, *i.e.* short essays composed in Latin.

Course X. Lucretius. *Senior i.* PROFESSOR CLARK

De rerum natura; *Cicero* de natura deorum. A study of Roman religion—elements and worship.

Course XI. Roman satire *Senior ii.* PROFESSOR CLARK

Reading of Juvenal, Perseus and Horace; study of the elements and development of Roman satire with a comparison of the writers in this field of literature,

Course XII. Latin elegiac poetry. *Senior iii.* PROFESSOR CLARK

A comparative study of Catullus Tibullus Propertius and Ovid.

Course XIII. Ovid. *Senior iii.* PROFESSOR CLARK

The Fasti, Epistolae and Metamorphoses; a study of Roman legends.
Not offered in 1901-02.

Course XIV. Patristic Latin. *Senior i, ii.* PROFESSOR CLARK

(*a*) Reading of the early church fathers, especially Tertullian, Augustine and Lactantius; (*b*) Latin hymns, 2 hours.

Course XV. Latin seminar. *Junior and senior.* PROFESSOR CLARK

The course of 1900-01 was a study of the Æneid of Vergil. Books vi to xii were translated with a critical study of Vergilian syntax. An investigation of the sources of the Æneid and of its influence upon later Latin was made. These subjects formed the basis for papers of original research. The subject for 1901-02 will be the conspiracy of Catiline or Prisciau's Libri institutonum Grammaticarum. This seminar is of special value to those who intend to teach Latin in the high schools of the state.

Course XVI. Latin seminar. *Junior and senior.* PROFESSOR PIKE

The work for 1899-00 consisted of a study of the reigns of Tiberius and Caligula. A body of notes, historical and critical, was compiled upon the text of Suetonius. Illustrative citations made from the Greek of Dion Cassius, Philo, and Josephus; from Paterculus, Pliny, Tacitus, etc. A series of original papers upon subjects connected with the above study. The subject for 1901-02 will be Seneca and stoic philosophy at Rome.

FOR GRADUATES.

Course XVII. Sanskrit. PROFESSOR CLARK

(*a*) Grammar and reader. (*b*) Reading of the story of Nala.

Course XVIII. History of early empire. PROFESSOR PIKE

A comparative study of original sources. Annals of Tacitus, Suetonius, Dion Cassius, Paterculus, etc. Papers upon subjects selected for original investigation. Twice a week throughout the year.

Course XIX. Roman antiquities. DR. GRANRUD

First Term—The development of the Roman political institutions from the earliest times to the end of the republic. Lectures and collateral reading in Livy and other historians.

Second Term—Critical study of the sources of Roman constitutional history, especially Cicero's—The State (De Republica) and The Constitution (De Legibus).

Third Term—Roman private antiquities: the family and clan; birth, education, marriage and burial; the Roman house and furniture, daily life and amusements. 2 hours per week throughout the year

Course XX. Roman drama. PROFESSORS CLARK, PIKE AND DR. GRANRUD

Plautus, Terence, Seneca. Not offered in 1901-02.

Course XXI. Roman history. PROFESSORS CLARK, PIKE AND DR. GRANRUD

Livy, Tacitus, Suetonius. Not offered in 1901-02.

Course XXII. Same as course ix. PROFESSOR PIKE

Course XXIII. Roman law. PROFESSOR CLARK

Not offered in 1901-02.

MATHEMATICS.

FOR UNDERGRADUATES.

Course I. Higher algebra. *Freshman i.*

Simple equations, inequalities. proportion, variation, progression, quadratic equations, simultaneous equations of the second degree, differentiation of algebraic functions, development of functions, logarithms.

Course II. Plane and spherical trigonometry *Freshman ii.*

With numerous applications.

Course III. Higher equations and elements of analytical geometry. *Freshman iii.*

Course IV. Analytical geometry. *Sophomore i.*

The conic sections, both by rectilinear and polar coördinates, producing equations of loci whose law of development is known, constructing and discussing such equations, transformation of coördinates, properties of loci by means of their equations.

Course V. Differental calculus. *Sophomore ii, iii.*

Differentiation of algebraic and transcendental functions, development of functions, maxima and minima, treatment of tangents, subtangents, normals, subnormals, asymptotes, direction and rate of curvature, evolutes, envelopes and curve tracing.

Course VI. Integral calculus. *Junior i.*
Integration of the various forms, rectification of curves, quadrature of plane and curved surfaces, cubature of volumes, equations of loci by means of the calculus.

Course VII. Determinants and solid analytical geometry. *Junior or senior ii, iii.*
The plane, the straight line in space, quadric surfaces, applications. Each of the above courses requires all of the preceding courses.

Course VIII. Differential equations. *Junior or senior ii, iii.*
Open to those who have completed the first six courses,

Course IX. Method of least squares. *Junior or senior ii.*
A study of the combination and adjustment of observations and the discussion of their precision as applied especially to engineering, physics and astronomy. Open to those who have completed the first six courses.

Course X. Descriptive geometry. *Junior iii, Senior i.*
Problems relating to points, lines, planes, solids, surfaces of revolution and warped surfaces; orthographic, isometric, horizontal, oblique, and perspective projections; shades and shadows. Recitations, lectures and practice. Open to those who have completed the first four courses.

Course XI Modern analytical geometry. *Senior i.*
Discussion of equations of the first and second degree (tri-linear co-ordinates), equations of tangents and polars for the three forms of the second degree equation, the principle of duality. Open to those who have completed the first seven courses.

Course XII. Theory of equations. *Senior i.*
Based on Burnside and Panton, including a review of the elementary properties of equations, discussion of the roots of unity, the solution of the cubic and the biquadratic, the proof that every equation has a root, symmetric functions of the roots, introduction to co- and in-variants. Open to those who have completed the first six courses.

Course XIII. Applied mechanics. *Senior i, ii, iii.*
Statics, dynamics, strength and elastic properties of the ordinary materials of construction, hydro-mechanics (study of the laws of pressure and the flow of liquids). Recitations and lectures. Open to those who have completed the first six courses.

FOR GRADUATES.

Course XIV. Determinants.

Course XV, Advanced work in co-ordinate geometry.

Course XVI. Advanced work in differential calculus.

Course XVII. Advanced work in integral calculus.

Course XVIII. Quaternions.

Course XIX. Theory of functions.

Course XX. Hyperbolic and elliptic functions.

Course XXI. Spherical projections.

Course XXII. History of mathematics.

Courses IV-XIII are offered to those who do not elect them in their undergraduate years.

MILITARY SCIENCE AND TACTICS.

For the instruction in military drill and administration the students are organized into a corps of cadets, consisting of a battalion of infantry, and a platoon of artillery.

A uniform of prescribed pattern is worn by all cadets during drill.

The uniform consists of blouse, trousers, vest and cap, modeled after the U. S. Military Academy cadet uniform, and costs in Minneapolis about $15 and is as neat and economical dress as the student can obtain.

Drill is required of all men in the freshman class i, iii, and sophomore class i, iii.

Military drill may be taken voluntarily by others outside of the freshman and sophomore classes and to encourage this, as it is considered beneficial not only to the individual student but to the State generally, the extra work is considered by allowing two year's drill to count as one study in the third term of the senior year. It is understood, however, that only one credit can be thus obtained.

Military instruction is intended to be so conducted as to develop a soldier-like bearing and foster a spirit of gentlemanly courtesy, soldierly honor and obedience to lawful authority, as well as to familiarize students with company and battalion manœuvers, guards and the theoretical and practical use of fire arms.

On the graduation of each class the commandant will report to the Adjutant-General of the Army the names of the graduates who have shown special aptitude for the military service and furnish a copy thereof to the Adjutant-General of the State.

The officers and non-commissioned officers are required to be good students in the other departments, soldier-like in the performance of their duties, exemplary in their general deportment and able to pass a creditable examination in drill regulations. In general, the officers are selected from the senior class; the sergeants from the junior class; and the corporals from the sophomore class,

CADET OFFICERS AND NON-COMMISSIONED OFFICERS.

MAJOR.

Walter J. Allen.

CAPTAINS:

James Everington.
Michael A. Kiefer.
Jonh F. Bernhagen.
Frank F. Jewett.
Frederick A. Stewart.

FIRST LIEUTENANTS:

Coates P. Bull.
William S. Frost.
George B. Otte, Adjutant.
Louis G. Cook.
Frank H. Klemer.
Paul S. Smith.

SECOND LIEUTENANTS.

Roger S. Mackintosh.
William S. Weston.
Karl G. Chrysler.
Charles E. Chubb.

Claud Z. Luse, Principal Musician.
Henry D. Campbell, Sergeant Major.
George Thomas, Chief Musician.
Guy M. Bean, Color Sergeant.

FIRST SERGEANTS:

Warren C. Knowlton.
Mason N. Case.
Urni S. Duncan.
Frank O. Fernald.
Norman G. Lind.

SERGEANTS:

James G. Stanley.
Percy S. Saunders.
Carl A. Herrick.
Joseph H. Davison.
John C. Hutchinson.
Robert P. Kelly.
Paul D. Burrill.
Theodore A. Beyer.
Ingram G. Kjosness.
Carl van F. Taylor.
Edward L. Sudheimer.
Robert Wood.
Halstead C, Moody.
Justin V. Smith.
Charles S. Alexander.

CORPORALS:

John W. Avery.
Ralph E. Lovett.
Arthur W. Saunders.
Stewart G. Collins.
Mark Page.
Clarence E. Austin.
E. Dwight Chase.
Raymond P. Chase.
Earl P. Mallory,
Chester H. Tibbetts.
Ray R. Knight.
E. A. Taylor.
Charles W. Brooke.
Claude L. Haney.
Jay B. Todd.
Walter De F. Prouty.
Campbell L. Bailey.
Putnam D. McMillan.
Robert W. Stevens.
Otho H. Campbell.
Royal R. Shumway.

August F. Stockman.
George Burglehaus.
Orison B. Robbins.
George Sverdrup.
Willis W. Grant.
Alfred C. Whitney.
James McG. Martin.
Harry E. Barlow.
Fred A. Garbett.
Jay C. Vincent.
Charles C. Conser.
James von Williams.
Esek R. Mosher.
Frank H. Nutter.
Leighton H. Smith.
Lucius W. Miller.

MINERALOGY.

FOR UNDERGRADUATES.

Course I. General mineralogy. *Junior i. ii, iii.* DR. BERKEY

The morphology of minerals, consisting of the elements of crystallography and the projection and construction of figures of crystals; the physical and chemical characters of minerals, with demonstrations a study of the native elements and the rock making minerals; the basis of mineral classification.

The ores and economic minerals are described and their crystal forms, physical properties and chemical composition, together with their occurrence and association, are treated. The most important groups of minerals are studied. Minerals are discussed in their genetic relationships and distribution.

Laboratory work consists of tests illustrating the range of minerals and the application of chemical and blowpipe analysis to the determination of species. An introduction to the methods of quantitative blowpipe analysis; special topics; reference reading and discussions.

Course II. Quantitative mineralogy.
Junior iii. PROFESSOR APPLEBY AND MR. CHRISTIANSON

Determination of values of ores. Lectures, recitations and laboratory work. Course i, metallurgy, in the school of mines.

Course III. Physico-chemical methods, with their applications, *Senior i.* DR. BERKEY

The methods of micro-chemical analysis described and demonstrated; the leading elements found in minerals are determined through the aid of crystalline precipitates of known compounds.

Course IV. Optical mineralogy. *Senior ii.* PROFESSOR HALL AND DR. BERKEY

A study of the structure of crystals and crystal grains.

An application of methods used in determining minerals by their optical properties; goniometric and stauroscopic practice, embracing the elements of lithology. Lectures and laboratory work.

Course V. The morphology of minerals. *Senior iii.* DR BERKEY

A study of crystallography, embracing projection and the geometric relations of crystal planes.

Course VI. An outline of mineralogy. *Junior or senior.* DR. BERKEY

A study of the methods of identification of minerals, with their applications. Conferences, readings and demonstrations. Once a week throughout the year.

FOR GRADUATES.

Course VII. PROFESSOR HALL AND DR. BERKEY

Original problems in morphological and physical mineralogy.

Course VIII. DR. BERKEY

Special investigations in physical and chemical mineralogy.

Course IX. PROFESSOR HALL AND DR. BERKEY

Description of mineral occurrence and association. Genetic relationships. Field work in connection with the different phases of the particular problem in hand.

MUSIC.

Students who are sufficiently advanced in music are allowed, under the conditions mentioned below, to take instumental music as one study through the junior and senior years: provided that no student shall receive more than six credits in music.

For instrumental music, whatever the instrument, students must be sufficiently advanced to play, with facility and accuracy, the major and minor scales and the equivalent of Czerny's Velocity Studies for the piano. The student's fitness will be determined by examination.

A minimum of eight hours per week must be given to lessons and practice, the character of the work to be reported upon each term, as in case of other studies.

The work to be taken under instructors in the Northwestern Conservatory of Music and the instruction to be paid for by those receiving it. The Conservatory makes special rates to the students of the University.

PEDAGOGY.

PROFESSOR KIEHLE

These courses are provided for those who wish, by a more extended scholarship and a more systematic study of education, to prepare for positions of supervision and teaching in the departments of higher education. They are also for the general student who, in the home and in the state, is interested in the proper care, training and education of children and youth, and who is willing to give to this subject the same intelligent study that is accorded to other problems of history and sociology.

Course I. Philosophy of education. *Junior i.*

The study of this course will be from the standpoint of the developing mind, including such subjects as the following: education defined; the development and education of mind conditioned by its physical and social environment; the natural order in the development of mental powers, and the proper method by which to improve them.

Course II. Methodology. *Junior ii.*

This course is the counterpart of the preceeding, being conducted from the standpoint of the subject matter as it is presented in the several subjects of science, including the following: the course of study; the conduct of the recitations; the natural order in which to prepare and to present a given lesson.

Course III. School organization and administration. *Junior iii.*

Including school law; organization of school districts; school supervision; school discipline; grading and promotion of pupils and school hygiene.

Course IV. Ancient education. *Senior i.*

This and the following course consists of an historical survey of the order and the methods by which civilization prepares the new generation for the life into which they are born. This course will deal with ideals and with education in pre-Christian Greece and Rome.

Course V. Medieval and modern education. *Senior ii.*

Here will be noted the introduction of the Christian ideal, and the education of the western world under the direction of the church and the state,

Consideration will be given to the educational theories of a civilization increasing in complexity, and to the men who as philosophers and practical reformers have contributed to present results.

Course VI. School systems. *Senior iii.*

This course will be an inquiry into the provisions which society makes for the education of its youth, and the methods by which schools are supported and their affairs administered. The following will be the order of study:

1. The school systems of Minnesota.
2. A study of the systems and institutions of other states, and the relation of the federal government to the whole,
3. The systems of Germany, France and England.

Visitation of schools. By the courtesy of the boards of education and the superintendents, the students in pedagogy will pursue a systematic course of observation in the several grades of instruction in the cities of St. Paul and Minneapolis, during the junior year. These visits will be reported and discussed in class.

Special seminar courses will be offered to a limited number of seniors who have taken the required courses in pedagogy and to graduate students who have had a satisfactory experience as teachers. The purpose of these courses will be to study the methods of teaching the leading subjects pursued in the secondary schools. The students admitted must have high rank, together with the endorsement of the heads of the several departments in which they propose to study. These courses will consist of bi-monthly visits to the high schools of the Twin Cities and on alternate weeks discussion in seminar of such matters as pertain to the respective subjects.

A special certificate of recommendation will be given to those who satisfactorily complete any of the above courses. This certificate will also bear the signatures of the academic department represented.

THE UNIVERSITY STATE TEACHERS' CERTIFICATE.

Upon graduation from the college of science, literature and arts, students who have completed two terms of psychology (or one of psychology and one of logic) before the close of the junior year, and the first three terms of pedagogy, and who have attained a general average of 85 per cent. in all studies, may apply for and will receive, upon the vote of the faculty, the University State Teachers' Certificate, which by state law authorizes them to teach in the public schools of Minnesota for two years from this date. After that time, upon satisfactory evidence of success, the certificate may be made perpetual by the endorsement of the state superintendent of public instruction and the president of the university.

The pedagogical society is an organization of graduate and undergraduate students pursuing work in this department. Its purpose is to investigate and report for discussion selected subjects and problems of education.

PHILOSOPHY AND PSYCHOLOGY.

FOR UNDERGRADUATES.

COURSES IN PSYCHOLOGY.

Course I. Descriptive psychology and logic. *Junior and senior i, ii, iii.*
PROFESSOR WOODBRIDGE, ASSISTANT PROFESSOR WILDE, AND MR. SWENSON

First term—Psychology of sensation.
Second term—Psychology of knowledge, feeling and will.
Third term—Elementary logic.

Course II. Experimental psychology. *Senior i, ii, iii.* MR. GALE

First term—Three hours a week in the psychology of the senses through demonstrations and experiments; following in outline Sanford's Laboratory Course in Experimental Psychology, with special individual experimenting and reading for thesis work. One hour a week in the anatomy and physiology of the nervous system through lectures, demonstrations with models original preparations, and lantern slides, and with practical laboratory dissections.

Second term—Demonstrations and experiments in memory and association; in reasoning, with special original tests of reasoning in mathematics, science, law, and ethics; in feeling and willing, with special reference to the basis of aesthetics and ethics.

Third term—The phenomena of "psychical research", i. e., thought-transference, spiritualism, suggestion in the various forms of mind-cures, hallucinations, and the deceptions of the senses in the preceeding phenomena and in conjuring. Open only to students of course i.

Course III. Advanced psychology, *Senior i, ii, iii.* MR. GALE

Laboratory and experimental work in original research. Eight hours a week. Open only to students of course ii.

Course IV. Physiological psychology. *Senior i.* MR. GALE
Special advanced study of brain cells and tracts through original material and through the comparative and development methods.

Course V. Anthropological psychology. [2] *Senior i.* PROFESSOR WOODBRIDGE
Study of primitive religious, moral, aesthetic, and intellectual conceptions. Open only to those who have completed course i.

Course VI. The psychology of music. [2] *Junior and senior ii.* MR. GALE
Lectures with experimental demonstrations to analyze the total aesthetic effects of music into its elementary components of tone quality and quantity, rhythm, melody, harmony, contrast, with the biographical, historical and personal associations, and its connections with poetry in songs and with the drama in opera. Based largely on original experimental material, together with such works as those of Helmholtz, Koenig, Stumpf, Riemann, Zahn, Lanier, Gurney, Gilman, Wallaschek and R. Wagner.

Extra hours will be given as illustrations in different forms of piano compositions, chamber music, song cycles of Schubert, Schuman and Brahms; piano arrangements of Beethoven's Ninth Symphony, and at least of Parsifal from Wagner's music-dramas. Special lectures will be given preparatory to the best public concerts during the musical season.

COURSES IN PHILOSOPHY.

Course I. History of philosophy
Junior and senior i, ii, iii. PROFESSOR WOODBRIDGE AND ASSISTANT PROFESSOR WILDE
Lectures and special study of individual philosophers.
First term—Greek philosophy. Special study of Plato.
Second term—Medieval and early modern philosophy. Special study of Hobbes.
Third term—Modern philosophy. Special study of Kant.

Course II. Aesthetics. *Junior and senior i.* ASSISTANT PROFESSOR WILDE
A study of the nature and principles of beauty, the origin and development of the artistic impulse, and a sketch of the history of aesthetic theory.

Course III. Ethics. *Junior and senior ii.* ASSISTANT PROFESSOR WILDE
An analysis of the facts of moral experience for the purpose of obtaining a theory of life and conduct.

Course IV. Philosophy of Religion. *Junior and senior iii.* ASSISTANT PROFESSOR WILDE
A study of the religious consciousness; the nature, function, and contents of religion.

Course V. Fundamental problems of philosophy.
Junior and senior ii. PROFESSOR WOODBRIDGE
An introductory course in philosophy designed for students not electing long courses in the department.

Course VI. The theory of knowledge. *Junior and senior iii.* PROFESSOR WOODBRIDGE
Open only to students who have taken course i in psychology, or course i in philosophy.

FOR GRADUATES.

COURSES IN PSYCHOLOGY.

Course VI. Experimental pyschology of feeling. MR. GALE
Rhythm, melody, harmony, color, proportion, movement, conduct.

Course VII. Experimental psychology of reasoning. MR. GALE
By question blanks, individual trials, analysis, and other means.

Course VIII. Psychology of childhood. MR. GALE
Study of a larger mass of original material (on three children) than any yet published—especially in feeling and reasoning.

Course IX. Reading of psychological works in German, French, and Italian. MR. GALE

Course X. ***Brain histology and brain microphotography.*** MR. GALE
Technical practice in the methods of Golgi and Weigert, and especially in the cutting of series. Study of a large and valuable collection of original preparations and photographs with the works of Barker, Donaldson, Edinger, Obersteiner, Kölliker, His, Flechsig, Retzius, Golgi and Ramon y Cayal.

COURSES IN PHILOSOPHY.

Course VII. ***Pre-Socratic Philosophy.*** PROFESSOR WOODBRIDGE
A critical study of the fragments of early Greek philosophy, with attempts at systematic reconstruction. 1900-01.

Course VIII. ***The philosophy of Aristotle.*** PROFESSOR WOODBRIDGE
A critical reading of his logical treatises, the metaphysics, and the psychology in the original Greek. 1901-02.

Course IX. ***The philosophy of Kant.*** PROFESSOR WOODBRIDGE
A critical reading of the three Critiques; the relation of Kant to the development of modern philosophy. 1901-02.

Course X. ***The philosophy of Hume.*** PROFESSOR WOODBRIDGE
A critical reading of Hume's philosophical works, the position of Hume in the development of English philosophy. 1900-01.

Course XI. ***Advanced logic.*** PROFESSOR WOODBRIDGE
Theory of knowledge and analysis of belief. 1900-01.

Course XII. ***The history of ethics.*** ASSISTANT PROFESSOR WILDE
A critical reading of the chief works in the history of ethics. 1901-02.

Course XIII. ***Systematic ethics.*** ASSISTANT PROFESSOR WILDE
A detailed study of the principles of conduct and the basis of moral obligation. 1900-01.

Course XIV. ***The Idealistic philosophy of religion.*** ASSISTANT PROFESSOR WILDE
A study of the religious philosophy of Kant, Fichte, and Hegel. 1900-01.

Course XV. ***The philosophy of Hegel.*** ASSISTANT PROFESSOR WILDE
A critical reading of the *Phenomenologie des Geistes* and smaller *Logik*. 1900-01.

Course XVI. ***Post-Kantian realism.*** ASSISTANT PROFESSOR WILDE
Lectures and discussions on the realistic opposition to Kant. 1901-02.

PHILOSOPHICAL SEMINAR.

The seminar meets bi-weekly in the evening during the winter months to read and discuss contemporary philosophy. The membership consists of the professors, instructors, and qualified students of the department.

PHYSICAL CULTURE.

FOR WOMEN.

MISS BUTNER

The course in physical culture is offered to the women of the University as a regular part of their work in the freshman year, and may be taken in any of the following years. It consists of systematic exercises for the freedom and development of all parts of the body.

It is a common observation that students often enter the University with an imperfect physical development because of an excessive use of some muscles, while others are weakened through disuse. This occasions attitudes and movements that are unseemly in appearance and unhealthful in their general effect.

The purpose of this course is to develop a strong and symmetrical physique with a graceful and easy carriage.

A physical examination is made of each student and physical measurements are taken in the fall and again in the spring.

In addition to the regular class work, "sports and pastimes" are open to all young women of the university. These include basket ball, battle ball and numerous other ball games, and also running games, all of which tend to cultivate the play instinct and give the nerve stimulus that comes from natural play.

FOR MEN.

DR. COOKE

A well equipped gymnasium in charge of a professional medical director is open for the young men. The training and exercise is under the immediate oversight and authority of the medical director and is wholly with a view to the healthful physical development of the whole student body.

All young men are required to be examined by the medical director of physical culture upon registration and during the course as often as the indications of the physical condition may require.

The decision of the director will be either:

1. Advisory, indicating what course of hygiene and exercise will best sustain and improve the health of the student, or

2. Mandatory, requiring the students to pursue the course of hygiene and physical exercise necessary for the proper care of health, and the discharge of their duties as students.

Gymnasium work is required of all men in the freshman class, one hour per week, (in two half hour periods if the director so decides) throughout the year. The required work includes a course of lectures on personal hygiene, during the first term.

PHYSICS.

FOR UNDERGRADUATES.

The mathematics of the freshman year is required as preparation for all courses in this department.

Course I (*long—first year*).

(*a*) Mechanics.	*Sophomore i.*
(*b*) Heat.	*Sophomore ii.*
(*c*) Sound and electostatics.	*Sophomore iii.*

With experimental lectures and laboratory work.

Course II (*long—second year*).

(*a*) Electricity and magnetism.	*Junior i.*
(*b*) Electricity and magnetism.	*Junior ii.*
(*c*) Light.	*Junior iii.*

With experimental lectures and laboratory work.

Course III (*short*)

(*a*) Mechanics and heat.	*Sophomore i.*
(*b*) Heat (continued), sound and light.	*Sophomore ii.*
(*c*) Electricity and magnetism.	*Sophomore iii.*

With experimental lectures,

Course IV. Advanced laboratory work. *Senior i, ii, iii.*

Open to those who have completed course ii.

FOR GRADUATES.

Course V. Advanced work in some special field; experimental investigations being the principal feature of the work.

Course IV is also open to graduate students desiring the work.

POLITICAL SCIENCE.

FOR UNDERGRADUATES.

N. B. In case changes of detail shall be found necessary at the opening of the year 1901-02, notice will be given.

ECONOMICS.

Course I. Elements. *Junior i.* PROFESSOR MCVEY

A thorough course in the elements of economics. The aim is to inculcate accepted doctrine, and show the nature and bearings of questions unsettled. Text book, problems, lectures and discussions.

Course II. Modern industrialism. *Junior ii.* PROFESSOR MCVEY

The development of the modern industrial system from the middle of the eighteenth century. So far as time allows the phenomena of corporations, monopolies and trusts are treated. Particular attention is paid to the question of state interference.

Course III. Commercial history and commercial documents. *Junior iii.* PROFESSOR MCVEY

A brief presentation of the history of commerce and a description of the forms and uses of the more important documents. The course is supplemented by examination of commercial forms. The student will prepare papers and problems. Lectures and collateral reading.

Course IV. Corporation finance. *Senior i.* PROFESSOR MCVEY

A study of the methods of financing modern corporations, and the analysis of their accounts and statements. Text-books, Green, Corporation Finance; Sumner's Investment securities. Lectures, collateral reading and problems. Not given 1902-03.

Course V. Economic geography. *Senior i.* PROFESSOR MCVEY

A discussion of the character of commercial relations, localization of industry, and such other peculiarities as may be ascribed to physical environment. Lectures and collateral reading. Not given in 1901-02.

Course VI. Money and banking. *Senior ii.* PROFESSOR MCVEY

Elements and principles of the subjects. Jevons, Money and Mechanism of Exchange, and Dunbar on Banking, are used.

Course VII. Advanced economics. *Junior iii.* PROFESSOR MCVEY AND PROFESSOR FOLWELL

Discussions and problems on leading topics. Hadley's Economics and Sumner's Problems are used. Open to students who have completed course i.

Course VIII. Taxation. *Senior i.* PROFESSOR FOLWELL

The principles and policy of taxation in modern states illustrated chiefly by American examples. Offered in 1901-02, alternate with course ix.

Course IX. Finance. *Senior i.* PROFESSOR FOLWELL

Public expenditure and debts, national, state and local. Financial administration and monetary policy of the United States. Offered in 1902-03. Alternates with course viii.

Course X. Transportation. PROFESSOR FOLWELL

The evolution of transportation in the United States, and by railroads in particular. Economic aspects and public policy of railroads. Offered in 1901-02. Alternates with course xi.

Course XI. Tariff history and policy. *Senior iii.* PROFESSOR FOLWELL

Brief history of tariff legislation in the United States, and a study of actual economic effects. Offered in 1902-03. Alternates with course x.

Course XII. Methods of investigation. PROFESSOR MCVEY

A course in the method of using libraries, collecting and organizing material, followed by actual investigation of important questions. The class meets one hour per week through the year, and is open to seniors and graduate students.

For a general course in economics students may take courses i, ii, viii, ix.

Special course in private economics, i, ii, iii, v, vi, vii, xii.

In public economics, i, iii, iv, vi, vii, viii, ix, x, xi, xii.

POLITICS.

Course I. The science of the state. *Junior i.* DR. SCHAPER

An account of the state as antecedent in idea to the government; its citizenship, territory, ends, means, importance, etc

Course II. The science of the government. *Junior ii.* DR. SCHAPER

An account of the government as the agent of the state; definition, electorate, parties, separation of functions; detailed treatment of the three great departments under the heads; historical development, creation, prerogatives and powers, procedure.

Course III. The elements of jurisprudence. *Junior iii.* DR. SCHAPER

A summary of substantive private law and a brief synoposis of administrative law, followed by a discussion of the contents and construction of the organic law of modern free states.

Course IV. The constitution and government of the United States.
Senior i. DR. SCHAPER

An account of the constitution of the United States as interpreted, and of the political administration of the government under it.

Course V. State constitutions and governments. *Senior ii.* DR. SCHAPER

An analytic study of commonwealth government, its growth and origin, with discussions of state and national relations. Papers on the various political institutions of the state are required. McVey's Government of Minnesota.

Course VI. City charters and governments. *Senior iii.* DR. SCHAPER

The nature and scope of municipal charters and city administrations as illustrated by some local example.

Course VII. Public international law. *Senior ii.* PROFESSOR FOLWELL

From a a carefully elaborated syllabus such topics as Intervention, Treaty making, Extradition, Rules of Modern War, Rights and Duties of Neutrals, &c., are selected for fuller treatment as time allows.

The preparation of papers on topics related to the instruction is part of the regular work in this department.

A moot senate meets weekly during the second term for practice in parliamentary proceedure. Open to volunteers from the junior and senior classes.

SOCIOLOGY.

Course I. General. *Senior iii.* DR. SMITH.

History and principles of the science, with discussions of pauperism, crime, and care of unfortunates.

FOR GRADUATES.

The particular lines and subjects of study are selected by individuals or groups after consultation with the head of the department. So far as possible instruction will be given to groups.

When insufficiently grounded in elementary subjects, graduates are permitted to join undergraduate classes, but are expected to do more work than is required of undergraduates.

Courses vii, viii, ix and x, above named, are planned and conducted in a manner suitable to graduate students.

Among subjects desirable for graduates electing work in this department and in which instruction will be given so far as the duties of the teaching force will permit are:

Economic schools and movements. Evolution of economic theory. The science and technique of statistics. The doctrine of rights. Comparative politics. Neutrality of states. Comparative sociology. Anthropology. Social institutions.

The political science seminar conducted by Professor Folwell meets weekly on Fridays throughout the year. Open to all graduate students of the department and to seniors especially interested.

PUBLIC HEALTH (SANITARY SCIENCE).

FOR UNDERGRADUATES.

Course I. Personal health. Professor Hewitt

Its essential; how the individual is to obtain and use them. One hour a week. Laboratory work, elementary examination of air, light, water, soil, clothing and food as affecting health.

Course II. The hygiene of the family and the house. [1] *Junior iii.*

Lecture, one hour a week. Laboratory (optional), two hours or more a week. Experimental work in ventilation and lighting, water supply, disposal of refuse of habitations, prevention and control of ill health and disease, duty of the family to the community.

Course III. Public health of communities and states. [1] *Junior iii.*

Its essentials and their relations to pressing social and political problems. International hygiene. One hour a week. Laboratory work (optional), (two hours a week), experimental study of public water supply, disposal of refuse, the hygiene of public buildings, streets, parks, etc. Boards of health and sanitary organizations.

FOR GRADUATES.

Course IV. Sanitary chemistry and physics as used in practice. Examples and experiments.

Course V. Sanitary relations of plants and animals to human health, demonstrations by experiments and examples.

Course VI. Literature and practice of the examination of water and air supply, illustrated by the study of existing examples and experiments.

Course VII. The cause of ill health, sickness and premature death, their discovery and prevention. Text-book and laboratory demonstration.

RHETORIC AND ELOCUTION.

RHETORIC.

Course I. Rhetoric. *Freshman i, ii, iii.*

Course II. English composition and rhetoric. [1] *Sophomore i, ii.*

Course III. Addresses, toasts, orations. [1] *Sophomore iii.*

Course IV. Literary criticism. *Junior i, ii, iii.* Professor Sanford

Study of models of English poetry, oratory, fiction, etc., with critical essays. Open to those who have completed course i.

Course V, Lectures upon the history of art. *Senior iii* Professor Sanford

With essays on art subjects. Open to students who have completed course i.

Course VI. Debate. *Senior i, ii, iii.* Professor Sanford

Course VII. Advanced rhetoric. *Junior i, ii, iii.* Mr. Firkins

Course VIII. Applied English etymology. *Agricultural freshmen i.* Mr. Firkins

(*b*) *Applied English syntax.* *Agricultural freshmen ii.*

ELOCUTION.

Course IX. Reading. [1] *Sophomore ii, iii.* ASSISTANT PROFESSOR McDERMOTT

Sketches from standard authors studies with special attention to articulation, enunciation, flexibility of voice and purity of tone.

Course X. Gesture, voice building and principles of vocal expression. [2] *Junior i.* ASSISTANT PROFESSOR McDERMOTT

This course aims at the following objects: An understanding of the vocal mechanism; the strengthening and cultivation of the voice; the correction of foreign accent, defective enunciation and common faults of quality such as aspirated, oral, pectoral, gutteral and nasal tones; the specific application of the principles of clearness, simplicity, strength and variety in delivery. Interpretation is approached from within not from without and correct thinking is made the basis of correct expression.

Course XI. The psychological side of vocal expression. [2] *Junior ii, iii.* ASSISTANT PROFESSOR McDERMOTT

In this course the functions of the dramatic instinct, the will, the intellect, the imagination and the emotions are considered independently and conjointly with reference to delivery. The effect upon expression of the neglect of any one of these elements is shown, and literature is studied with a view to the harmonious development of all.

Course XII. The vocal interpretation of miscellaneous classic literature. [2] *Junior i.* ASSISTANT PROFESSOR McDERMOTT

This course is supplementary and is intended to give opportunity for further practice of principles taught in course x and xi; but it may be taken independently and is open to any qualified junior or senior.

Course XIII. The vocal interpretation of American poets. *Junior ii.* ASSISTANT PROFESSOR McDERMOTT

This is a continuation of course xii.

Course XIV. The vocal interpretation of British poets. [2] *Junior iii.* ASSISTANT PROFESSOR McDERMOTT

This is a continuation of course xiii.

Course XV. American oratory. *Senior i.* ASSISTANT PROFESSOR McDERMOTT

Standard orations are analyzed; synoposes, oral biographies, accounts of historical settings and expositions of the orator's style and logic are required. Original orations and debates are prepared, and a short selection from the oration under consideration is committed for practice in delivery. Beside class, work each student is given a brief period for individual criticism; for this reason only a limited number can be admitted.

Course XVI. British oratory. *Senior ii.* ASSISTANT PROFESSOR McDERMOTT

Course XVII. Ancient oratory. *Senior iii.* ASSISTANT PROFESSOR McDERMOTT.

Course xv, xvi, xvii will not be offered in 1901-02.

SCANDINAVIAN LANGUAGES AND LITERATURE.

FOR UNDERGRADUATES.

Course I. Language course for beginners.
- (*a*) [4] Swedish. — *Junior or senior i, ii, iii.*
- (*b*) [4] Danish-Norwegian. — *Junior or senior i, ii, iii.*

Course II. [4] *Scandinavian literature before 1800.*
- (*a*) [2] History of literature. — *Junior or senior i, ii, iii.*
- (*b*) [2] Study of special authors. — *Junior or senior i, ii, iii.*

Course III. [4] *Scandinavian history before 1500.* *Junior or senior i, ii, iii.*

Course IV. Language courses, advanced.
- (*a*) [4] Danish-Norwegian. *Junior or senior i, ii, iii.*
- (*b*) [4] Swedish. *Junior or senior i, ii, iii.*
- (*c*) [2] Icelandic. *Senior i, ii, iii.*

Course V. [4] *Scandinavian literature of the xix century.*
- (*a*) [2] History of literature. *Junior or senior i, ii, iii.*
- (*b*) [2] Study of special authors. *Junior or senior i. ii, iii,*

Course VI. [4] *Scandinavian history.* *Junior or senior i, ii, iii.*

FOR GRADUATES.

Course VII. Icelandic or old Norse.
The history, language and literature of Iceland and Norway from earliest times to 1500 A. D.

Course VIII. Old Swedish.
The history, language and literature of Sweden from earliest times to 1500 A. D.

Course IX. Old Danish.
The history, language and literature of Denmark from earliest times to 1500 A, D.

Course X. Modern Danish lauguage and literature.

Course XI. Modern Swedish language and literature.

Course XII. Modern Norwegian language and literature.

THE WEYERHAEUSER CHAIR OF SEMITIC LANGUAGES AND HISTORY.

Whether these courses will be offered during the year 1901-1902 is uncertain.

Course I. Hebrew accidence and syntax. *Junior or senior i, ii. iii,* PROFESOR JEWETT
Translations from and into Hebrew.

Course II. Critical study of Isaiah. Twice a week. *Junior or senior iii.*

Course III. Assyrian. Grammar and reading of selected texts. *Junior or senior i.*

Course IV. Arabic. Grammar and reading of selected texts. *Junior or senior ii and iii.*

Course V. Aramaic. (*a*) *Classical;* (*b*) *Biblical.* Grammar and reading of selected texts.
A and *b* will come twice a week through the third term and will be offered in alternate years.

Course VI. History of the Hebrews.
- (*a*) From the earliest time to the fall of Samaria. *Junior or senior i.*
- (*b*) From the fall of Samaria to A. D. 70. *Junior or senior ii.*

Course VII. Mohammedan history to the end of the Crusades. *Junior or senior iii.*
This course may be taken independently of course vi.

School of Technical and Applied Chemistry

GENERAL STATEMENT.

The regular four years' course in the school of chemistry, leading to the degree of bachelor of science, is designed for those who wish to become teachers of chemistry, analysts, investigators, manufacturing and applied chemists. The course here presented includes general, organic, analytical theoretical and applied chemistry. The course includes, besides these various chemical subjects, extended work in physics, metallurgy, mineralogy, crystallography, geology, botany, bacteriology, drawing, language and mathematics.

Electives are offered in order to give the students an opportunity of selecting subjects important to them, but which are not at present included in the regular course. The chief object is to enable them to take up animal biology and its allied subjects preparatory to special physiological chemistry. The course is also arranged so that history of philosophy, economics and history may be chosen conveniently.

The student will find the work of sufficient range to give him a broad, liberal, scientific education.

UNCLASSED STUDENTS.

Unclassed students are subject to the same rules and regulations as unclassed students in the college of science, literature and the arts.

GRADUATE WORK.

The degree of master of science or doctor of philosophy will be conferred upon graduates of any reputable college or university upon fulfillment of the regular requirements of the University.

EQUIPMENT.

Laboratories. The building formerly known as Science Hall has been completely remodeled to meet the needs of the department of chemistry. The building is 198 by 78 feet, and consists of several large laboratories well equipped for a wide range of chemical work. The general laboratory is located on the first floor and is large enough to accommodate 168 students. The laboratory tables are arranged with cupboards, drawers and locks and supplied with gas and water. Connected with this laboratory by means of sliding windows, is a preparation room which is directly joined to the general store room. The remaining part of this floor is given to cloak rooms, furnace and motor rooms and a large lecture room with a gallery designed to comfortably seat 350 students. The qualitative laboratory, located on the second floor, is arranged with tables similar to those of the general laboratory and will accommodate 120 students. The library and three technical laboratories are likewise on this floor. The third floor contains the quantitative laboratory large enough to accommodate 60 students. Directly connected with this laboratory are the balance, preparation, evaporation and drying rooms. There are also on this floor, six special laboratories, an organic laboratory, a physical laboratory, a lecture room and a museum. There is a suite of rooms on the fourth floor entirely given to photography.

Library. The chemical library contains complete sets of many of the more important journals. It contains besides these special sets, a well represented list of analytical and technical works, as well as many rare old works of great historical value. Most of the important journals are taken, thus enabling the student to keep abreast of the times. All books are easily accessible, with only the necessary restrictions to guard against injury and loss.

INDUSTRIAL MUSEUM.

Considerable space is given to a collection in industrial, technical and applied chemistry. There is a large collection of chemicals with specimens of each in the various stages of preparation and purification. A collection of nearly all the elements with most of their important salts; a large number of mining and metallurgical specimens, including most of the important ores, together with many rare specimens in crystallography. The collections of coals and petroleums are especially valuable for lecture and technical work. There is a large collection of dyes, organic and inorganic, mordants, textile, and other materials used in dyeing and bleaching, with a rapidly increasing collection of clays and materials used in the making of glass, earthenware, porcelain and brick. A collection of furnace products, models and series of charts, blue prints and photographs illustrating a wide range of technical and chemical processes is being added.

COURSE OF STUDY.

FRESHMAN YEAR.

FIRST TERM.	SECOND TERM.	THIRD TERM.
Algebra (4)	Trigonometry (4)	Analytical geometry (4)
German or French or Latin or English (4)	German or French or Latin or English (4)	Descriptive geometry (4)
Qualitative analysis (4)	Qualitative analysis (4)	German or French or Latin or English (4)
Freehand drawing (4)	Constructive geometry (4)	Qualitative analysis (4)
Military drill (2)		Military drill (2)

SOPHOMORE YEAR.

Botany (4)	Botany (4)	Botany (4)
Organic chemistry (4)	Organic chemistry (4)	Organic chemistry (4)
Quantitative analysis (4)	Quantitative analysis (4)	Quantitative analysis (4)
Bacteriology (2)	Assaying (2)	Assaying (3) lab. Monday
Mineralogy (4)	Mineralogy (4)	
Military drill (2)		Military drill (2)
Rhetorical work (1)	Rhetorical work (1)	Rhetorical work (1)

JUNIOR YEAR.

Wine and beer analysis (2)	Theoretical chemistry (3)	History of chemistry (4)
Geology (4)	Geology (4)	Applied geology (4)
Physics (4)	Physics (4)	Physics (4)
Water analysis (4)	Iron and steel analysis (4)	Micro-chemistry (3)
Metallurgy (3)	Gas analysis (4)	Colloquium (2)
Inorganic preparations (3)	Metallurgy (3)	Industrial chemistry (4)
		Crystallography (3)

SENIOR YEAR.

Chemistry of carbohydrates (4)	Electro-chemistry (3)	Food adulterations (2)
		Photographic chemistry (2)
Metallurgy (4)	Metallurgy (4)	Electro-metallurgy (4)
Mineral analysis (3)	Geology (4)	Applied chemistry (2)
Colloquium (2)	Special problems (3)	Metallurgy (4)
Elective (4)	Elective (4)	Elective (4)
Elective (4)	Elective (4)	Elective (4)
Thesis	Thesis	Thesis

COURSES IN CHEMISTRY.

Course II. (*a*) *Qualitative analysis.*
Freshman i. 96 hours. Assistant Professor Nicholson
Lectures and laboratory work. The course includes the general reactions of the metals and their qualitative separation.

(*b*) *Qualitative analysis.* *Freshman ii.* 96 hours. Assistant Professor Nicholson
A continuation of course i (*a*).

(*c*) *Qualitative analysis.* *Freshman iii* 96 hours. Assistant Professor Nicholson
Lectures and laboratory work. Reactions and identification of the acids. Open to those who have completed course ii (*b*).

Course IV. *Quantitative analysis.*
Sophomore i. 96 hours. Assistant Professor Sidener
Lectures and laboratory work. The course includes an introduction to quantitative and a beginning of gravimetric analysis. Open to those who have completed course ii.

Course V. Quantitative analysis.
Sophomore ii. 96 hours. ASSISTANT PROFESSOR SIDENER
Lectures and laboratory work. A continuation of course iv. Open to those who have completed course iv.

Course VI. Volumetric analysis.
Sophomore iii. 96 hours. ASSISTANT PROFESSOR SIDENER
Lectures and laboratory work. The course includes an introduction to volumetric analysis with a discussion of standard solution and the necessary stœchiometric calculations. Open to those who have completed course v.

Course VII. (a) Organic chemistry. *Junior i*, 96 hours. PROFESSOR FRANKFORTER
Lectures and laboratory work. The course includes the aliphatic series with a preparation of the more important compounds supplemented by Levy's Anleitung für Darstellung Organischer Präparate.

(*b*) *Organic chemistry.* *Junior ii*, 96 hours. PROFESSOR FRANKFORTER
Completion of the aliphatic and the beginning of the aromatic series.

(*c*) *Organic chemistry.* *Junior iii*, 96 hours. PROFESSOR FRANKFORTER
Lectures and laboratory work. The course includes the aromatic series with a preparation of some of the more important compounds supplemented by Fischer's Organischer Präparate.

Course VIII. Theoretical chemistry. *Junior i*, 48 hours. PROFESSOR FRANKFORTER
Lectures and readings. The course includes a study of Lothar Meyer's Modernen Theorien der Chemie, Oswald's Grundriss der Allgemeinen Chemie and Remsen's Theoretical Chemistry. Open to those who have completed course iii.

Course IX. History of chemistry. *Junior ii*, 48 hours. PROFESSOR FRANKFORTER
Lectures and reading. This course includes a full historical discussion of alchemy and chemistry. Open to those who have completed course iii.

Course X. Water analysis. *Junior i*, 96 hours. PROFESSOR FRANKFORTER
Lectures and laboratory work. The course includes an exhaustive discussion of the chemical and sanitary properties of water. Open to those who have completed course vi.

Course XI. Gas analysis. *Junior ii*, 96 hours. DR. HARDING
Lectures and laboratory work. The work includes an exhaustive chemical examination of the common gases, with a determination of light and heat efficiency of combustible gases. Open to those who have completed course ix.

Course XII. The chemistry of sugar.
Senior i, 96 hours. ASSISTANT PROFESSOR NICHOLSON
Lectures and laboratory work. The course includes a discussion of the carbohydrate group with the important methods of analysis. Open to those who have completed course vi.

Course XIII. Industrial chemistry. *Senior iii*, 48 hours. ASSISTANT PROFESSOR SIDENER
Laboratory work and reading. The course includes the analysis of various commercial products. Open to those who have completed course vi,

Course XIV. Wine and beer analysis. *Senior ii*, 48 hours. MR. PEASE
Lectures and laboratory work. The course includes the determination of alcohol and other constituents in wine and beer, with a special study of fermentation. Open to those who have completed course vi.

Course XV. Special problems.
Senior i, 48 hours or more. ASSISTANT PROFESSOR SIDENER
Laboratory work. The course includes the working out of various mineralogical, technological and metallurgical problems. Open to those who have completed course vi.

Course XVI. Photographic chemistry. *Senior iii*, 48 hours. PROFESSOR FRANKFORTER
Lectures and laboratory work. The course includes a study of the compounds affected by the chemical rays of light, and a discussion of developers and fixers, photo-engraving, photo-reliefs and color photography. Open to those who have completed course vi.

Course XVII. Domestic chemistry. *Senior iii*, 96 hours. DR. HARDING
Lectures and laboratory work. The course includes a study of the common household products, as sugar, starch, bread, soap, soda, vinegar, coffee, tea and the various etherial oils, spices, milk and meat. Open to those who have completed course v.

Course XVIII. Electro-chemical analysis. *Senior ii*, 48 hours. PROFESSOR FRANKFORTER
Lectures and laboratory work. The course includes the qualitative and quantitative separation of the metals by electrolysis. Open to those who have completed course vi.

Course XIX. Micro-chemical analysis. *Junior iii*, 48 hours. DR. HARDING
Lectures and laboratory work. The course includes the methods for the determination of minute quantities of substances by means of the microscope. Open to those who have completed course vi.

Course XX. Applied chemistry. *Senior iii*, 48 hours. ASSISTANT PROFESSOR SIDENER
Some of the subjects discussed in this course are: Pigments, paints, oils, varnishes, gun-powder, nitro-glycerine, gun cotton and the chemical manufacture of acids, bases and salts. Open to those who have completed course vi.

Course XXI. Food adulterations. *Senior iii*, 48 hours. DR. HARDING
An examination of common food products for adulterants. Open to those who have completed course vi.

Course XXII. Iron and steel analysis. ASSISTANT PROFESSOR SIDENER
Lectures and laboratory work. The course includes the rapid determination of iron by the various methods as well as the determination of associated elements, sulphur, phosphorus, silicon, manganese and carbon. Open to those who have completed course vii.

Course XXIII. Mineral analysis. ASSISTANT PROFESSOR SIDENER
The course includes the analysis of building stones and some of the most important minerals.

Course XXIV. Inorganic preparations. DR. HARDING
The preparation of inorganic salts, supplemented by Bender's Anorganische Präparatkunde.

Course XXV. Colloquium. ASSISTANT PROFESSOR SIDENER
A thorough quiz in general inorganic chemistry.

Course XXVI. Colloquium. PROFESSOR FRANKFORTER
A thorough quiz in general organic chemistry.

Course XXVII. Special problems. ASSISTANT PROFESSOR SIDENER
This course includes work on ores of base metals, limestones, slags, etc. 48 hours or more.

Course XXVIII. Physical chemistry. DR. HARDING
Lectures and laboratory work. The laboratory work will include that laid down by Reychler with such references as Nernst and Ostwald. Open to those who have completed course i.

COURSES FOR GRADUATE STUDENTS.

1. *Special inorganic chemistry.*
2. *Electro-chemistry.*
3. *Organic chemistry.*
4. *The alkaloids.*
5. *Analytical chemistry.*

THE COLLEGE OF

ENGINEERING AND THE MECHANIC ARTS

The College of Engineering and the Mechanic Arts.

FACULTY.

Cyrus Northrop, LL. D., *President.*

OFFICERS OF THE DEPARTMENT OF CIVIL ENGINEERING.

William R. Hoag, C. E., *Professor of Civil Engineering, in charge of Road and Sanitary Engineering.*

Frank H. Constant, C. E., *Professor of Structural Engineering.*

C. E. Crownover, C. E., *Scholar in Civil Engineering.*

OFFICERS OF THE DEPARTMENT OF MECHANICAL ENGINEERING.

John J. Flather, Ph. B., M. M. E., *Professor of Mechanical Engineering.*

Harry E. Smith, M. E., *Assistant Professor of Mechanical Engineering in charge of Experimental Engineering and Shop Work.*

C. Coleman Jett, B. M. E., *Instructor in Machine Design and Drawing.*

William B. Newhall, M. E., *Student Assistant in Laboratory.*

William H. Merriman, *Instructor in Machine Work.*

James M. Tate, *Instructor in Carpentry, Pattern and Foundry Practice.*

Benjamin Garbett, *Assistant in Foundry.*

George Plowman, *Assistant in Forge Shop.*

John Armbruster, *Machinist.*

OFFICERS OF THE DEPARTMENT OF ELECTRICAL ENGINEERING.

George D. Shepardson, A. M., M. E., *Professor of Electrical Engineering.*

Frank W. Springer, E. E., *Assistant Professor of Electrical Engineering.*

OFFICERS OF THE DEPARTMENTS OF ENGINEERING AND MECHANICS, AND MATHEMATICS.

Henry T. Eddy, C. E., Ph. D., LL. D., *Professor of Engineering and Mechanics.*

Arthur Edwin Haynes, M. S., M. Ph., Sc. D., *Professor of Engineering Mathematics.*

Joseph A. Thaler, E. E., *Instructor in Engineering Mathematics.*

OFFICERS OF THE DEPARTMENT OF PHYSICS.

Frederick S. Jones, M. A., *Professor of Physics.*

John Zeleny, B. S., B. A., *Associate Professor of Physics.*

Anthony Zeleny, M. S., *Instructor in Physics.*

Henry A. Erikson, B. E. E., *Instructor in Physics.*

OFFICERS OF THE DEPARTMENT OF CHEMISTRY.

George B. Frankforter, M. A., Ph. D., *Professor of Chemistry.*

Charles F. Sidener, B. S., *Assistant Professor of Chemistry.*

Edward E. Nicholson, M. A., *Assistant Professor of Chemistry.*

Frank W. Emmons, B. S., *Graduate Assistant in Chemistry.*

OFFICERS OF THE DEPARTMENT OF DRAWING AND INDUSTRIAL ART.

WILLIAM H. KIRCHNER, B. S., *Assistant Professor of Drawing.*
AMELIA I. BURGESS, *Instructor in Freehand Drawing.*
NELLIE S. TRUFANT, *Instructor in Drawing.*
HENRIETTA CLOPATH, *Instructor in Freehand Drawing.*

OFFICERS OF THE DEPARTMENT OF POLITICAL SCIENCE.

WILLIAM W. FOLWELL, LL. D., *Professor of Political Science.*
FRANK L. MCVEY, Ph. D., *Professor of Private Economics.*
WILLIAM A. SCHAPER, Ph. D., *Instructor in Political Science.*

OTHER DEPARTMENTS GIVING INSTRUCTION.

CHRISTOPHER W. HALL, M. A., *Professor of Geology and Mineralogy.*
CHARLES P. BERKEY, Ph. D., *Instructor in Mineralogy.*
JOHN G. MOORE, B. A., *Professor of German.*
CHARLES W. BENTON, Litt. D., *Professor of French.*
HAYDN S. COLE, Lieut. U. S. A., *Instructor in Military Science.*
FRANCIS P. LEAVENWORTH, M. A., *Professor of Astronomy.*
WILLIAM S. PATTEE, LL. D., *Lecturer on Contracts and Torts.*
HARRY W. DIXON, *Engineer.*

ORGANIZATION OF THE COLLEGE.

In this college there are three regular courses of study, viz, civil engineering, mechanical engineering and electrical engineering, leading to corresponding professional degrees.

There is also organized in this college a four years' course of study in science and technology, leading to the degree of bachelor of science, with an additional year leading to the professional degree.

DRAWING AND INDUSTRIAL ART.

A four years' course, in drawing and industrial art, is offered to students prepared for admission to the freshman class, and who show a talent for such work. No degree is offered for the completion of this course.

UNCLASSED STUDENTS.

Unclassed students are permitted to pursue, under the direction of the faculty, one or two lines of study, selected from some regular course. Such students must be persons of mature years, and present preparation sufficient to admit them to the freshman class. Persons of mature years, who shall give satisfactory evidence of ability to do with credit the work applied for, may be admitted by vote of the faculty.

GENERAL.

For general regulations governing fees, admission, advanced standing, choosing of courses, daily routine, examinations, and graduation, see statement concerning same regulations in college of science, literature and the arts.

ADMISSION.

Examinations for admission are held only at the beginning of the year. See calendar and program of examinations.

Students prevented from entering at the beginning of the year may be admitted at a subsequent date, when the circumstances are such as to justify the action. Such students are, however, at a great disadvantage, and all students expecting to enter the University are urged to be present at the beginning of the year.

All applicants should present themselves to the registrar, who will furnish them with application blanks and directions how to proceed with their examinations and registration.

GENERAL REGULATIONS GOVERNING ADMISSION.

I. Students will be admitted to the freshman class on **passing the regular entrance examinations.**

II. No student will be admitted **if conditioned in more than three half-year subjects,** or their equivalent.

III. Graduates of any Minnesota State high school will be admitted **without examination, provided—**

(1) That the school maintain a **full four-year course** of high school work.

(2) That the applicant present to the registrar the principal's certificate showing the satisfactory completion **of all the studies required for admission** to the desired University course.

IV. Graduates of Minnesota State high schools, who are deficient in **not more than three half-year subjects,** or their equivalent, **may be excused** from entrance examinations **in such subjects as the enrollment committee may decide;** such candidates should present themselves to that committee **not later than Tuesday of examination week.**

V. Graduates of Minnesota State high schools whose principal's certificate shows them to be deficient in **more than three half-year subjects,** or their equivalent, even though they have made such additional preparation as they deem necessary, must take, nevertheless, the regular entrance examinations in all subjects, as provided in sections I and II, unless excused by vote of the faculty; and persons wishing to present reasons for such excuse **should report to the enrollment committee not later than Tuesday of examination week.**

VI. Graduates of the **advanced courses of Minnesota normal schools** will be admitted upon the same terms as graduates of State high schools.

VII. Any Minnesota high school or academy **not under supervision of the State High School Board,** but requiring for graduation **a four-years' course,** exclusive of the common school branches, conforming **essentially in distribution of time** to the entrance requirements of at least one of the University courses, will, upon application, be inspected by a committee, and, after favorable recommendation, **may be accredited by the faculty** in all respects as are the state high schools, **provided,—**

(1) That the school be **open to inspection** at any time by the University, and

(2) That it take such **supplementary examinations as may be prescribed** from time to time.

VIII. Graduates from schools in other states, whose diplomas admit to **reputable colleges,** will be received subject to the regulations that apply to graduates of Minnesota State high schools.

IX. Applicants from schools not coming within any of the above classes **must take the regular entrance examinations,** or present State High School Board Certificates.

Students bringing records from accredited schools are required to present them on the blank form provided for the purpose by the University. Blank forms may be obtained from the Registrar. No other form or certificate will be accepted.

High School Board certificates will be accepted in lieu of an examination in the subjects which they represent.

In all cases the faculty reserves the right to require a student to take supplementary examinations if he does not sustain himself creditably in his course.

REQUIREMENTS FOR ADMISSION TO THE FRESHMAN CLASS.

N. B.—Time element, as indicated with each subject, is essential.

A three years' course of reading in English classics.
English Composition, one year.
Algebra, elementary, one year.
Algebra, higher, one-half year.
Geometry, plane, one year.
Geometry, solid, one-half year.

In addition to the above named subjects, which are required for all courses, and for which substitutes cannot be accepted, applicants shall present evidence of preparation in **eight** year-credits, or their equivalent to be chosen from the following list:

Latin, (four years.)
  Grammar, one year.
  Cæsar, four books, one year.
  Cicero, six orations, one year.
  Vergil, six books, one year.
Greek, (two years.)
  Grammar, one year.
  Anabasis, four books, one year.
German, (two years.)
  Grammar, one year.
  Literature, one year.
French, (two years.)
  Grammar, one year.
  Literature, one year.
English.
  Latin element, one year. Latin grammar will be accepted in lieu of this subject.
  Literature, one year.
History, Greece and Rome, one-half year.
  England, one-half year.
  Modern, one-half year.
  Medieval, one-half year.
  Senior American, one-half year.
Civics, one-half year.
Political economy, one-half year.
Physics, one year.

Chemistry, one-half or one year.
Botany, one-half or one year.
Zoology, one-half or one year.
Astronomy, one-half year.
Geology, one-half year.
Physiography, one-half year.
Drawing, one-half or one year.
Shopwork, one-half or one year.

SYLLABUS.

For syllabus of subjects required for admission, see pages 53-57.

Advanced Standing—The University accepts records from all reputable colleges for credit to advanced standing. Such records are accepted so far as they are equivalent to the work done in this University. In bringing records from other institutions, the certificate must be on the official blanks of the institution granting the certificate, and should show:

1. The subject studied; if a language, the work read, etc.
2. The time spent upon each subject.
3. Ground covered in laboratory work in case of laboratory subjects.
4. The result—it is sufficient to state that the subject was creditably completed.

Records from institutions, whose entrance requirements are not essentially equivalent to the requirement of the University, will not be accepted unquestioned; the credit to be allowed will be decided in individual cases by the enrollment committee.

CHOOSING OF COURSES.

The courses of this college are open, free of all charge for instruction, to all persons over fourteen years of age, whether residents of the state or not. Applicants are free to select their course of study at the time of admission, but cannot thereafter change, except when allowed by vote of the faculty.

DAILY ROUTINE.

Monday is taken as a holiday. The morning session begins at 8:30 o'clock; a general assembly of the faculty and students is held each day at 10:25 o'clock, at which there are brief and simple religious exercises.

EXAMINATIONS.

At the close of each term, examinations are held in the studies of the term. In order to be "passed" the student must obtain seventy-five per cent. In determining the standing of a student in any subject the result of his daily work in that subject is combined with the result of the final examination in the ratio of two to one.

Students who pursue any subject unsuccessfully are reported as "incomplete," "conditioned" or "failed." "Incomplete" work must be made up within one term, at the convenience of the professor concerned, or become a "condition," subject to the rule governing conditions. "Conditions" not made up before the subject is offered again become "failures," subject to rule governing failures. "Failures" must be taken over again in class. The examinations for conditioned students are held at the beginning of the fall term in the work of the fall term, at the beginning of the winter term in the work of the winter term, and at the beginning of the spring term in the work of the spring term.

Any student having a condition in any study may have the option of presenting himself for examination in that study, either at the time regularly set for making up conditions in that study or at the begining of the college year, immediately after the long vacation.

A student who at any time is deficient in more than four studies of four hours per week, loses his class rank and is regarded as a member of the next lower class.

Students whose absences in any term exceed four weeks in the aggregate, are not permitted to take the term examinations without special permission of the faculty.

GRADUATION.

Students completing courses of study to the satisfaction of the faculty of the college, are entitled to receive the appropriate baccalaureate degree. Any person may undergo, at suitable times, examination in any subject, and if such person pass in all the studies and exercises of a course, he is entitled to the appropriate degree; **provided**, however, that at least one full year must be spent at the University, before such degree shall be granted, and **provided**, the examination, in every case, be held before a committee of the faculty appointed for that purpose.

COURSES OF STUDY.

NOTE—The figures after a subject denote the number of periods per week. Shopwork, field work, laboratory and drawing periods are of two hours duration.

FRESHMAN YEAR.

FIRST TERM.

The same for all courses: Mathematics, 5; German or French, 4; Qualitative analysis, 4; Freehand drawing, 4; Carpentry, 4; Military drill, 2; Rhetorical work, 1.

SECOND TERM.

For the civil engineering course: Mathematics, 5; German or French, 4; Qualitative analysis, 4; Mechanical drawing, 4; Surveying, 3; Rhetorical work, 1.

For the mechanical and electrical engineering courses: Mathematics, 5; German or French, 4; Qualitative analysis, 4; Mechanical drawing, 4; Carpentry and pattern work, 5; Rhetorical work, 1.

THIRD TERM.

For the civil engineering course: Descriptive geometry, 4; German or French, 4; Surveying, 4; Platting, 2; Mathematics, 4; Military drill, 2; Rhetorical work, 1.

For the electrical and mechanical engineering courses: Mathematics, 4; German or French, 4; Qualitative analysis, 4; Descriptive geometry, 4; Pattern work and foundry, 5; Military drill, 2; Rhetorical work, 1.

SOPHOMORE YEAR.

FIRST TERM.

CIVIL ENGINEERING.	MECHANICAL ENGINEERING.	ELECTRICAL ENGINEERING.
Analytical geometry, 5.	Analytical geometry, 5.	Analytical geometry, 5.
Physics, 4.	Physics, 4.	Physics, 4.
Topography, 4.	Machine or forge work, 5.	Machine or forge work, 5.
Materials of engineering, 2.	Materials of engineering, 2.	Materials of engineering, 2.
Descriptive geometry, 4.	Descriptive geometry, 4,	Descriptive geometry, 4,
Rhetorical work, 1	Rhetorical work, 1.	Rhetorical work, 1.
Military drill, 2.	Military drill. 2.	Military drill, 2.

SECOND TERM.

Differential calculus, 5.	Differential calculus, 5.	Differential calculus, 5.
Physics, 4.	Physics, 4.	Physics, 4.
Working drawings, 4.	Working drawings, 4.	Working drawings, 4.
Engineering Instruments, 4.	Mechanism, 2.	Mechanism, 2.
Highways, 3.	Forge or machine work, 5.	Forge or machine work, 5.
Rhetorical work, 1.	Rhetorical work, 1.	Rhetorical work, 1.

THIRD TERM.

Integral calculus, 5.	Integral calculus, 5.	Integral calculus, 5.
Physics, 4.	Physics, 4.	Physics, 4.
Higher surveying, 4.	Mechanism, 2.	Mechanism, 2.
Field work, 3.	Machine construction, 5.	Machine construction, 5.
Practical astronomy, 3.	Kinematic drawing, 4.	Kinematic drawing, 4.
Rhetorical work, 1.	Rhetorical work, 1.	Rhetorical work, 1.
Military drill, 2.	Military drill, 2.	Military drill, 2.

JUNIOR YEAR.

FIRST TERM.

CIVIL ENGINEERING.	MECHANICAL ENGINEERING.	ELECTRICAL ENGINEERING
Mechanics, 5.	Mechanics, 5.	Mechanics, 5.
Physics, 4.	Physics, 4,	Physics, 4.
Curves and earthworks, 3.	Machine design, 4.	Machine design, 4.
Field work, 4.	Tool construction, 5.	Tool construction, 5.
Geology, 2.	Industrial electricity, 2.	Industrial electricity, 2.
	or	
Stresses in framed structures, 3.	Stresses in framed structures, 3.	

SECOND TERM.

Mechanics, 5.	Mechanics, 5.	Mechanics, 5.
Physics, 4.	Physics, 4.	Physics, 4.
Machine design, 4.	Machine design, 4.	Machine design, 4
Stresses in framed structures, 4.	Dynamos and motors, 3.	Dynamos and motors, 3.
Materials of engineering, 2. (Mech. laboratory.)	Materials of engineering, 2. (Mech. laboratory.)	Materials of engineering, 2. (Mech. laboratory.)
Geology, 2.	Steam engine, 3.	Steam engine, 3.

THIRD TERM.

Hydraulics, 5.	Hydraulics, 5.	Hydraulics, 5.
Structural details, 4.	Electrical laboratory, 5.	Electrical laboratory, 5.
Municipal engineering, 4. or Railroad work, 5.	Machine design, 4. (Valve gears.)	Electrical design, 3.
Physics, 2.	Physics, 2.	Physics, 2
Least squares, 2,	Dynamos and motors, 4.	Dynamos and motors, 4.
Stresses in framed structures, 2.	Mechanical laboratory, 2,	Mechanical laboratory, 2.

SENIOR YEAR.

FIRST TERM.

CIVIL ENGINEERING.	MECHANICAL ENGINEERING.	ELECTRICAL ENGINEERING.
Masonry, 5.	Thermodynamics, 5.	Thermodynamics, 5.
Electric power, 5.	Steam boilers, 2.	Electrical laboratory, 3.
Structural design, 5.	Machine design, 4. (Steam engine).	Alternating currents, 4.
Experimental laboratory, 2.	Mechanical laboratory, 3.	Mechanical laboratory, 3.
Political science, 2.	Political science, 2.	Political science, 2.
	Elective, 4.	Elective, 4.

SECOND TERM.

Structural design, 5.	Prime movers, 3.	Prime movers, 3.
Railway economics, 3.	Gas engines, 2.	Alternating currents, 4.
Experimental laboratory, 2,	Mechanical laboratory, 4.	Electrical laboratory, 3.
Arches, 3.	Machine design, 4. or Railway design, 4.	Electrical design, 2, or Electric railways, 2.
Water supply engineering, 4.		Electric lights, 2.
Political science, 2.	Political science, 2.	Political science, 2.
Sanitary engineering, 3.	Elective, 4 or 6.	Elective, 4.
Thesis.	Thesis.	Thesis.

THIRD TERM.

Swing bridges, 4.	Machine design, 4. or Railway design, 4.	Electrical design, 4.
Sanitary engineering, 3.	Compressed air, 3.	Central stations, 4.
Geodesy, 3.	Mechanical laboratory, 4.	Electrical transmission, 4,
Contracts and specifications, 2.	Contracts and specifications, 2.	Contracts and specifications, 2.
Political science, 2.	Political science, 2.	Political science, 2.
Field work, 3.	Elective, 4,	Elective, 2.
Thesis, 4.	Thesis, 4.	Thesis, 4.

NOTE 1. For special work along railway engineering lines, see page 47.

Courses of Instruction.

THE MODERN LANGUAGES.

The work in modern languages will be directed to those practical ends which are so essential to a well-rounded technical education. One year's work in German or French, is required. The grammar and extracts from standard authors, among them distinguished scientific men, receive such attention that the student may prepare himself for mastering technical literature.

GERMAN.

Course I. Advanced. For those who present German for admission to the University.

(*a*) *Historical prose.* Schiller's Thirty Years War or Egmont's Leben und Tod, and Gedichte. Schiller's life and works.

Writing from dictation; oral and written work based on the text. Dr. Lyon's Dutsche Grammatik.

(*b*) *Hodge's Course in Scientific German.* Dictation; oral and written exercises continued. Grammar continued.

(*c*) *Hodge's Course in Scientific German.* Continued. Original letters, notes and essays, Grammar completed.

Course II. Elementary. For those who enter the University without German,

(*a*) Whitney's Brief German Grammar and Bernhardt's German Composition.

(*b*) Grammar and composition continued.

(*c*) Scientific prose: Gore's German Science Reader. Grammar and composition concluded.

FRENCH.

Course I. For those who present French for admission.

(*a*) Syntax and composition, Merimée, Duval, History of French Literature.

(*b*) Victor Hugo, selections; Les génies de la Science.

(*c*) Cuvier, Les revolutions du globe, La Revue Scientifique.

Course II. For those who enter the University without French:

(*a*) Chardenal's French Course.

(*b*) La Nature.

(*c*) Luquien's French Prose of Popular Science.

MATHEMATICS.

In imparting a knowledge of the mathematical subjects, special emphasis is placed upon their practical application. This gives a student a firmer grasp of the more important parts of these subjects and some appreciation of their real value, before reaching those technical studies where mathematics furnishes the only sure basis for professional knowledge and a most powerful instrument for use in original research.

Course I. Higher algebra. *Freshman i, ii,* 66 hours.

Advanced work on equations containing radicals, simple and quadratic equations, proportion, variation, progressions, summation of special series, binomial theorem, indeterminate coefficients, logarithmic series, Taylor's formula and the treatment of higher equations, including Cardan's rule for cubics.

Course II. Plane trigonometry. *Freshman i, ii*, 44 hours.
Trigonometric functions of acute angles, of angles in general, application of logarithms, solution of right triangles, general properties of triangles, practical applications, including the solution of cubic equations having real and unequal roots.

Course III. Spherical trigonometry. *Freshman iii*, 22 hours.
Review of some truths of solid and spherical geometry. Napier's rules, solution of right spherical triangles, general properties of spherical triangles and the application of spherical trigonometry to the solution of practical problems.

Course IV. Analytical geometry. *Freshman iii*, 22 hours; *Sophomore i*, 55 hours.
Coördinate systems, transformation of coördinates, algebraic equations of different degrees produced and discussed by the aid of these systems, transcendental equations and loci:—three dimensions; the point, plane, line, surfaces and solids.

Course V. Differential calculus. *Sophomore ii*, 55 hours.
The differentiation of algebraic and transcendental functions, successive differentiation, series, derivatives, maxima and minima, tangents, subtangents, normals, subnormals, illusory forms, asymptotes, direction and rate of curvature, radius of curvature, evolutes, envelopes, singular points and curve tracing

Course VI. Integral calculus. *Sophomore iii*, 40 hours.
The integration of various algebraic and transcendental differentials, rectification of plane curves, quadrature of plane surfaces and surfaces of revolution, cubature of volumes of revolution, and the production of the equations of loci by integrating certain conditional differentials.

Course VII. Some practical applications *Sophomore iii*, 15 hours.
of the calculus to mechanics and physics, maxima and minima, center of gravity, center of hydrostatic pressure and moment of inertia.

The foregoing courses in mathematics are required, *in the order given*, of all under graduates in each of the engineering courses.

Course VIII. Advanced calculus and differential equations. *Junior or senior i, ii*, 24 hours.
Preparation courses v and vi.

Course IX. Method of least squares. *Junior iii*, 24 hours. PROFESSOR LEAVENWORTH.
A study of the combination and adjustment of observations and the discussion of their precision, especially as applied to engineering problems.

RHETORICAL WORK.

(*a*) *Freshman i*, 12 hours
An outline of rhetoric; study of the sentence; elements of style; choice and use of words; exercises in composition.

(*b*) *Freshman ii, iii*, 24 hours.
Outline of rhetoric continued; study of the paragraph and of the various kinds of composition, with especial emphasis on description and practical exposition; exercises in composition.

Members of the freshman class will be given an opportunity, at the beginning of the year, to prove by means of an examination, their fitness to be excused from this subject.

(*c*) *Rhetoric continued.* *Sophomore i, ii, iii*, 36 hours.
Sight composition, exercises in describing engineering instruments, machines, materials, processes and structures. Technical debates.

The work throughout the year to be illustrated by models drawn from scientific, technical and other literature.

DRAWING AND INDUSTRIAL ART.

ENGINEERING DRAWING.

Course I. Freehand. *Freshman i,* 96 hours.

Lettering, geometric forms and engineering details in outline, including working sketches, translations and the elements of perspective.

Course II. Mechanical. *Freshman ii,* 96 hours.

Conventional methods, machine and structural details and standard sizes and shapes.

Course III. Descriptive geometry. *Freshman iii,* 96 hours.

Problems relating to points, lines, planes, solids, interpenetrations, surfaces of revolution, tangents and developments, including the constructive geometry involved. Recitations and lectures.

Course IV. Descriptive geometry. *Sophomore i,* 96 hours or 48 hours

Orthographic, isometric, horizontal, topographic, oblique, and perspective projections; shades and shadows, line shading and brush tinting. Open to students who have completed course iii.

Course V. Working drawings. *Sophomore ii,* 96 hours

Engineering details, assembly drawings, mechanical movements, tracing and blue printing.

Course VI. Machine drawing. *Sophomore iii,* 48 hours

Detail and construction drawings of mining machinery, head frames, cars, skips and other mining appliances.

Course VII. Topographic drawing. *Sophomore i,* 48 hours

Plans, sections, timbering, and mine conventions. Topographic maps.

Course VIII. Instrumental. *ii, iii,* 192 hours

Problems, projections, sections, developments and interpenetrations. With conventional renderings in line and wash.

FINE ARTS.

Course I. Drawing. *i, ii, iii,* 288 hours

From models, casts and nature. Study of the principles of perspective and light and shade. In charcoal, line, and wash.

Course II. Antique. *i, ii, iii,* 288 hours

Studies of the human figure from casts, in charcoal. Fractions, torsi, masks, busts, statues and groups.

Course III. Life. *i, ii, iii,* 288 hours

Studies in charcoal from the living model (heads and figures with costumes). Sketches in pencil, charcoal, red chalk, and pen and ink. Open to those who have taken course i or course ii.

Course IV. Water color. *i, ii, iii,* 288 hours

From still life and nature. Open to those who have completed course i or course ii.

Course V. Pen and ink. *i, ii, iii,* 288 hours

Exercises in line work and drawing for illustrative work. Open to those who have completed course i or course ii.

Course VI. Oil painting. *i, ii, iii,* 288 hours

Studies of groups of still life, plants and flowers, and sketching from nature. Open to those sufficiently prepared.

Course VII. Modeling. *i, ii, iii,* 288 hours

In clay, from the antique, and casting in plaster.

Course VIII. Lectures and reading. *i, ii, iii,* 36 hours

On the principles and methods of perspective, light and shade, color, composition, and the history of art.

APPLIED ART.

Course I. Design. *i*, *ii*, *iii*, 288 hours

The anatomy of pattern and geometrical design, planning of ornament, color harmony, plant analysis and conventionalism, traditional ornament and animate forms.

Course II Analysis of ornament. *i*, *ii*, *iii*, 144 hours

Study of the characteristics of style. Outlines of historic ornament. Lectures, recitations and collateral reading.

Course III. Practical designing. *i*, *ii*, *iii*, 288 hours

Original designs and accompanying working drawings for flat ornament; wood. stone and metal work.

Course IV. Lettering. *i*, 36 hours.

Medieval and modern alphabets, plain and ornamental.

MECHANICS.

(*a*) APPLIED MECHANICS.

Course I. Statics and dynamics. *Junior i*, 60 hours.

A study of the laws of equilibrium, motion, work and energy as applied to particles and rigid bodies. Recitations and lectures. Open to students who have completed the first five courses in mathematics.

Course II. Mechanics of materials. *Junior ii*, 60 hours.

A study of the strength and elastic properties of materials of construction, the principles governing the design of beams, columns and shafts. Recitations and lectures. Open to students who have completed course i.

Course III. Hydraulics. *Junior iii*, 60 hours.

A study of the laws of equilibrium and flow of fluids; pumping machinery. Open to students who have completed course i.

(*b*) THEORETICAL MECHANICS AND MATHEMATICAL PHYSICS.

FOR GRADUATES AND UNDERGRADUATES who have completed calculus.

Course I. The potential function and spherical harmonics.

Course II. Analytical statics and electrostatics.

Course III. Dynamics of rigid bodies.

Course IV. Circular, hyperbolic and elliptic functions with their physical applications.

FOR GRADUATES OF EITHER COLLEGE

who have had advanced work in mathematics.

Course V. Directional calculus, vector analysis and determinants.

Course VI. Analytical theory of the conduction of heat.

Course VII. Theories of elasticity and sound.

Course VIII. Wave theories of light, heat and electricity.

Course IX. Kinetic theory of gases.

Course X. Hydrodynamics and fluid motion.

Course XI. Theory of functions with applications.

PHYSICS.

FOR UNDERGRADUATES.

The mathematics of the freshman year is required as preparation for all courses in this department.

Course I (first year).

(*a*) Mechanics.	*Sophomore i.* 48 hours.
(*b*) Heat.	*Sophomore ii*, 48 hours.
(*c*) Sound and electostatics.	*Sophomore iii*, 48 hours.

With experimental lectures and laboratory work.

Course II (second year).

(*a*) Electricity and magnetism.	*Junior i*, 48 honrs.
(*b*) Electricity and magnetism.	*Junior ii*, 48 hours.
(*c*) Light.	*Junior iii*, 24 hours.

With experimental lectures and laboratory work.

Course IV. Advanced laboratory work. *Senior i, ii, iii.*
Open to those who have completed course ii.

FOR GRADUATES.

(*a*) *Special problems* in electricity, heat and light.
(*b*) *Investigations* in mechanics and optics.

GEOLOGY.

Course I. Geology. *Junior i, ii,* 24 hours. DR. SARDESON.
A condensed course in physical and historical geology, for civil engineers, geodynamics, structural geology, physiography, stratigraphic and historical geology are treated of successively. Excursions to typical localities will supplement work done in the class room. Lectures and references.

CONTRACTS AND SPECIFCATIONS.

Course I. Contracts. *Senior iii*, 12 hours, DEAN PATTEE.
Lectures on the law of contracts; essential elements of a legal contract; contracts by agents; mutual assent; misrepresentation in the contract; invalidity of contract through fraud; alterations; consideration. Agreements—oral and written; enforcement of contract.

Course II. Specifications. *Senior iii*, 12 hours.
A study of engineering specifications. Classes of specifications; essential features; clauses; details. Examples. Lectures, recitations and practice in writing specifications.

ASTRONOMY.

Course I. Practical astronomy. *Sophomore iii*, 36 hours. PROFESSOR LEAVENWORTH.
Spherical co-ordinates; time; latitude; longitude, and other astronomical problems. Lectures.

POLITICAL SCIENCE.

Course I. Introduction to political science. *Senior i.* 24 hours. DR. SCHAPER.
A study of the state, its growth, forms and people. Lectures and reading.

Course II. Elements of economics. *Senior ii*, 24 hours. PROFESSOR McVEY
Lectures upon the principal questions in economics, such as consumption, production and distribution. Students are expected to do collateral reading and to write papers upon elementary problems.

Course III. Transportation. *Senior iii*, 20 hours. PROFESSOR FOLWELL

Lectures upon transportation, tracing its development in the United States and discussing the questions of ratemaking, competition and pools. Papers and reading.

CHEMISTRY.

Course II. (*a*) *Qualitative analysis.*

Freshman i, 96 hours. ASSISTANT PROFESSOR NICHOLSON

Lectures and laboratory work. The course includes the general reactions of the metals and their qualitative separation.

Course II. (*b*) *Qualitative analysis.*

Freshman ii, 96 hours. ASSISTANT PROFESSOR NICHOLSON

A continuation of course ii (*a*).

Course II. (*c*) *Qualitative analysis.*

Freshman iii, 96 hours. ASSISTANT PROFESSOR NICHOLSON

Lectures and laboratory work. Reactions and identification of acids, followed by practical problems in qualitative analysis. Open to those who have completed course i (*b*)

CIVIL ENGINEERING.

MUNICIPAL AND SANITARY ENGINEERING.

Course I. Hydrographic survey. *Sophomore iii*, 20 hours.

Text work on making soundings; methods of determining discharge of streams. Following this the electric current meter of the department is rated and a survey made, employing it to determine the volume of flow in the Mississippi river, followed by a plat of the cross-section of the river at point of survey.

Course II. Water supply engineering. *Senior ii*, 48 hours.

Rainfall and evaporation and available water supply as determined by soils and topographical features. Methods and means employed in water collection, purification and distribution for domestic and manufacturing purposes; embankments; reservoirs, mechanical filters, sand filters, etc. Text books, Fanning, Hill. Open to those who have completed course iii in applied mechanics (hydraulics).

Course III. Sanitary engineering. *Senior i, ii*, 36 hours.

Sewerage systems, separate and combined; sewage disposal; intermittent filtration; broad irrigation; chemical treatment. Text book, Rafter and Baker. Open to those who have completed course ii.

Course IV. Municipal engineering. *Junior iii*, 44 hours.

Problems relating to city streets, pavements, subways, etc.

RAILWAY AND HIGHWAY ENGINEERING.

Course VI. (*a*) *Curves and earthworks.* *Junior i*, 36 hours.

Problems attending final location surveys of railroads and track laying, theory of the computation of volumes and preparation of preleminary estimates. Carhart text book and notes.

(*b*) *Execution in field of practical problems.* 96 hours.

Illustrating the analytical work of (*a*), including the computation of earthwork of railroad grades and pits, platting profiles and construction of maps.

Course VII. Railway structures. *Junior i.*

The different standard structures relating to railroad construction and maintenance are presented by lectures, the student making working drawings with bills of material, such structures as the following being treated: cattle guard, snow fence, timber culvert, pile bridge, water tank, station house, and trestle. Field and office. Details obtained from actual structures as far as possible.

Course VIII. Railway location and estimates. *Junior iii*, 96 hours.
Reconnoitering and preliminary surveys are made, followed by field maps and final location; profiles and cross-sectioning. Complete estimates covering the cost of earth and rock work, timber structures and right of way involved in the actual construction of the line are made, together with plans of important bridges and a right of way map of the adopted location.

Course IX. Railway economics *Senior ii*, 36 hours.
Discussion on the economic location of railways. Text, Wellington,

Course X. Highway construction and maintenance. *Sophomore ii*, 36 hours.
The economic relation of highways in transportation, with a treatment of the practical questions relating to materials and methods necessary to maintain good streets and highways. Lectures, Spalding as text, with collateral reading, reports and essays.

STRUCTURAL ENGINEERING,

Course VI. Stereotomy. (Elective.) *Sophomore ii*, 72 hours.
Working drawings by which to cut the stones for masonry, wing walls, bridge abutments, culverts, domes and arches, including groined and cloistered arches, and the intersection of two or more galleries. Lectures and drawings.

Course XII. Stresses in framed structures.
Junior i, 60 hours. *Junior ii*, 72 hours, *iii*, 22 hours.
Theory of structures and determination of stresses by graphical and analytical methods in the modern types of structures, for static and for moving loads. Theory of the deflection of framed structures. Text book work, numerous problems and lectures; drawing room work in graphic statics. Text book, Johnson's Stresses in Framed Structures.

Course XIII. Structural details. *Junior iii*, 96 hours.
Study of the methods of proportioning individual members of framed structures and the designing of joints and splices in steel and wooden structures. Design and complete working drawing of a plate girder railway bridge. Text book work: lectures and numerous problems in class room. About one-half of the term in the drawing-room for work in designing. Text-book, Johnson's Stresses in Framed Structures, Hand Books of Steel Manufacturers. Reference, Merriman's Part II, Bridge Series. Open to students who have completed course xii.

Course XIV. Structural design. *Senior i*, 120 hours, *ii*, 120 hours.
Theory and design of important modern steel structures, including railway and highway bridges, steel mill buildings, steel office buildings, standpipes and towers, and other problems of structural interest. In this course the student becomes familiar with the method of designing important structures, and several complete designs with necessary computations, detail drawings, specifications and estimates are made. As much of the work is done in the class room under the immediate leadership of the instructor as possible. Such drawings are made in the drawing room as may involve important principles and details, and give the student a certain facility in making structural drawings. During this year occasional shop drawings are made for the same purpose but expertness in structural draughting is not aimed at. The large collection of blue prints, photographs and designs of important structures in the possession of the department is put to constant use for illustrative purposes. Reference, Johnson's Stresses in Framed Structures, Merriman's Part III Bridge Series. Open to students who have completed courses xii and xiii.

Course XV. Swing bridges. *Senior iii*, 96 hours.
Study of different forms of swing, draw and lift bridges, including the determination of stresses, proportioning and detailing of parts, design of rim and center bearing turntables, end-locking apparatus and operating machinery. A design is made in

which the amount of power required to operate the bridge is completely determined, and the shafting, gears and other parts necessary for the transmission of the power are proportioned. Work in the class room and drawing room. Text, Wright's Swing Bridges, Merriman's Part IV Bridge Series. Reference, Johnson's Stresses in Framed Structures, Unwin's Machine Design. Open to students who have completed courses xii to xiv inclusive.

Course XVI. Suspension and arch bridges. *Senior ii*, 72 hours.

Theory of the suspension bridge and of the elastic arch, with application to practical problems. Class room work and drawing. Text, Church's Mechanics, chapter xi, Merriman's Part IV Bridge Series. Reference, Howe's Arches, DuBois' Stresses in Framed Structures, chapters ix and x. Open to students who have completed courses xii to xiv inclusive.

Course XVII. Masonry construction. *Senior i*, 120 hours.

Properties of stones, bricks, cement and concrete, and their use in engineering structures. Foundations, retaining walls, piers and abutments, dams and chimneys. Theory and design of masonry arches. Class room work and drawing room work in designing. In designing considerable attention is given to architectural effects. Text-book, Baker's Masonry Construction, Church's Mechanics, Howe's Retaining Walls, Wegman's Dams. Reference, Fowler's Coffer Dam Process, Patton's Foundations. Open to students who have completed course xii.

Course XVIII. Experimental laboratory. *Senior i*, 48 hours, *ii*, 48 hours.

(*a*) Tests of strength and physical properties of brick, stone and cements.

(*b*) Special investigations of the properties of structural materials, and of the strength of joints, columns and framed structures. Laboratory work.

TOPOGRAPHICAL ENGINEERING.

Course XX. Surveying. *Freshman ii*, 36 hours.

Work consists of recitations, lectures and illustrative problems relating to chaining, field problems employing chain; methods of keeping field notes; determination of area—D. M. D. and rectangular co-ordinate method; compass and transit surveying; study of instruments and their adjustment; methods for overcoming obstacles, determination of heights and distances inaccessible; methods of supplying omissions, of platting compass and transit surveys; discussions of the methods of laying out and dividing land, including the public land surveys of the United States.

Course XXI. (*a*) *Surveying.* *Freshman iii*, 48 hours.

This time is devoted to the execution in the field of many of the problems discussed in the previous term. The care, proper use and adjustment of all instruments used are treated by field exercises. Chain, compass and transit surveys are made and circuits of level-lines run by each party. A meridian line is established by each party by observations on Polaris.

(*b*) *Draughting.* 48 hours.

This time is given to construction of diagonal scales, protractors, circular and straight verniers. All surveys made in the field are platted and areas computed. Solution of problems and useful office reduction of all field notes.

Course XXII. (*a*) *Topography.* *Sophomore i*, 96 hours.

The methods of conducting topographical surveys are taken up in the order of increasing accuracy. At first a text-book is used to acquaint the student with the instruments employed, method of use and theory of adjustment. Lectures are given on the details of field work; parties of topographers are formed and each makes a complete topographic survey of a certain tract. Observations on Polars at elongation for azimuth and at culmination for latitude conclude the field work. Individual work characterizes this course. Text, Baker.

(*b*) *Draughting,* 24 hours.
Notes taken in course ii (*a*) are reduced, areas computed and topographical maps made of land surveyed.

Course XXIII. Analytical study of engineering instruments. *Sophomore ii,* 66 hours.
Continued, including stadia and gradientor. Reduction charts are made and stadia work of course ii reduced and platted, cross-wires are replaced in transits.

Course XXIV. Higher surveying. *Sophomore iii,* 48 hours.
Analytical study of the aneroid and mercurial barometers and barograph is made for determining their efficiency in hypsometric surveys; of the solar compass and solar transit and various solar attachments for establishing government standard lines and the plane-table and stadia as a rapid means of prosecuting topographical surveys. Text-books, "Johnson's Theory and Practice of Surveying" and Baker's "Engineering Instruments."

Course XXV. Field work and platting. *Sophomore iii,* 66 hours.
Observations are made with barometers for difference of level; checked with spirit levels. Meridians and parallels of latitude are run with solar compass and attachments, and an outline survey made, computed and platted. A plane-table survey, employing stadia and telemeter, is made by each party, and each student makes a map of the same. A general map is compiled from all the maps, a tracing made and blue prints taken by each student.

Course XXVI. (*a*) *Geodesy.* *Senior iii,* 48 hours.
Lectures and text-book; Geodetic reconnaissance; base-line measurement, employing bars and steel tape; measures of angles, horizontal and vertical; field methods for time, latitude, longitude and azimuth; theory of computing geographical positions. Lectures and text.

(*b*) *Field and office work.* 72 hours.
Making and reducing observations, illustrating work.

Course XXVII. Geodesy.
Precise and trigonomic leveling; adjustment of observations and projection of maps.

MECHANICAL ENGINEERING.

SHOP WORK.

Course I. Carpentry and joinery. *Freshman i,* 96 hours.
Wood working, use of tools, bench work.

Course II. Carpentry and pattern making. *Freshman ii,* 120 hours.
Lathe and bench work. Patterns for moulding, core boxes. Lectures and practice,

Course III. Foundry practice and pattern making. *Freshman iii,* 72 hours.
Patterns and flasks. Moulding, casting, mixing metals, brass work and core making. Shop practice, recitations and lectures. Preparation, course ii.

Course IV. Blacksmithing. *Sophomore i or ii,* 120 hours.
Use of tools, forging, welding, tool dressing, tempering. Lectures and practice.

Course V. Machine work. *Sophomore i or ii,* 120 hours.
Chipping, filing, machine work, gear cutting, finishing. Lectures and practice.

Course VI. Machine construction. *Sophomore iii,* 120 hours.
Construction of some machine or instrument. Lectures and practice. Preparation, course v.

Course VII. Tool construction. *Junior i,* 120 hours.
Tools, taps, reamers, cutters, and other special work. Lectures and practice. Preparation, course vi.

Course VIII. Machine construction. *Senior ii*, 96 hours. (Elective)
Construction of patterns and machine work for special apparatus, or machinery, designed by the student.

Course IX. Shop economics, *Senior iii*, 24 hours. (Elective.)
Shop and factory organization and management; cost systems.

MACHINE DESIGN.

Course X. Principles of mechanism. *Sophomore ii and iii*, 48 hours
The transmission of motion without consideration of the strength of parts. Gear wheels, cams, belts, screws, epicyclic trains, parallel motions, quick-return movements. Lectures and recitations. Preparation, course iv in mathematics.

Course XI. Kinematics. *Sophomore iii*, 96 hours
Graphical diagrams of the paths, speeds and accelerations of important mechanisms; centroids; analysis of mechanisms; construction of cams; kinematic pairs. Preparation, course x, and vi engineering drawing.

Course XII. Machine design. *Junior i and ii*, 192 hours
Calculation and design of such machine parts as fastenings, bearings, rotating pieces, belt and tooth gearing. Recitations, lectures and drawing-room practice. Preparation, course vii, mathematics.

Course XIII. Machine design. *Junior iii*, 96 hours
Application of graphical methods to the design of valve gears and link motions; Zeuner diagrams, indicator cards. Lectures and drawing-room practice. Preparation, course xviii.

Course XIV. Machine design. *Senior i*, 96 hours
Calculations and working drawings for a high speed automatic steam engine. Theoretical diagrams and determination of details. Preparation, course xiii.

Course XV. Machine design. *Senior ii*, 96 hours
Original designing including machinery for changing size and form. Boiler design, cranes, pumping and transmission machinery and engineering appliances. Lectures, problems and drawing-room practice. Preparation, course xiv.

Course XVI. Machine design. *Senior iii*, 96 hours
Continuation of course xv, with specifications for particular problems.

Course XVII. Tool design. *Senior ii, or iii*, 96 hours
Design of special tools for manufacturing interchangeable parts; jigs and milling fixtures. Preparation, course vii and xii.

STEAM ENGINEERING AND PRIME MOVERS.

Course XVIII. Steam engine. *Junior ii*, 36 hours
Mechanics of the steam engine. Work in the cylinder; effect of reciprocating parts; steam distribution. Mechanism of steam engines. A study of the details of modern steam engines. Valves and valve gears. A study of the slide valve, link motions and other reversing gear; automatic cut off gears and the Zeuner diagram. The steam engine indicator. Principles and operation of the instrument, indicator rigging; indicator cards; compounding. Preparation, course i in applied mechanics.

Course XIX. Thermodynamics. *Senior i*, 60 hours
The mechanical theory of heat as applied to the steam engine and other motors. Preparation, courses i and iii in applied mechanics.

Course XX. Gas and oil engines. *Senior ii*, 24 hours
Theory and construction of gas and oil engines, devices for starting, igniting, and governing; gas producers; the adaptation of oils for generating power. Preparation, course xix.

Course XXI. Compressed air. *Senior iii*, 36 hours.

Air compressors and motors; pneumatic transmission. Air and ammonia refrigeration and ice manufacture. Preparation, course xix.

Course XXII. Prime movers. *Senior ii*, 36 hours.

Theory of turbines, hydraulic motors and wind mills. Preparation, course iii in applied mechanics.

Course XXIII. Steam boilers. *Senior i*, 24 hours.

Application of theory and practice in the design and construction of steam boilers, chimneys, boiler settings and accessories, smoke prevention, incrustation; methods of operating boilers with safety and economy. Preparation, course i in applied mechanics.

Journal Club—Open to the seniors and juniors. Once a week.

ENGINEERING LABORATORY.

Course XXIV. Materials of engineering. *Sophomore i*, 24 hours.

Lectures and recitations on the production and properties of engineering materials.

Course XXV. Strength of materials. *Junior ii*, 48 hours.

Laboratory work investigating the strength and physical qualities of iron, steel, brass, copper, belting, chains, beams, brick and stone. Preparation, course i applied mechanics.

Course XXVI. Mechanical laboratory. *Junior iii*, 48 hours.

Continuation of course xxv; also exercises in valve setting, indicator practice, calibration of steam gauges, efficiency of screws and hoists. Preparation, course xix.

Course XXVII. Measurement of power. *Senior i*, 24 hours.

A study of the methods employed in measuring power. Dynamometers, Prony brakes; efficiency of motors; power required to drive machine tools and shafting. Recitations. Preparation, course iii in applied mechanics.

Course XXVIII. Mechanical laboratory. *Senior i*, 96 hours.

Calibration of weirs, meters, dynamometers and other apparatus. Testing lubricating value of oils; calorimetry; tests of water motors, pumps, injectors, steam engines and boilers. Preparation, course xxvi.

Course XXIX. Mechanical laboratory. *Senior iii*, 96 hours.

Tests of gas and hot air engines, locomotive testing, and special research work. Preparation, course xxvii.

Course XXX. Mechanical laboratory. *Senior iii*, 72 hours.

Special modification of courses xxviii and xxix for students in mining and metallurgy.

RAILWAY MECHANICAL ENGINEERING.

The following courses are available to seniors desiring to prepare themselves for special work in railway engineering.

Course XXXI. Railway technology. *Senior i*, 48 hours.

The object of this course is to familiarize the student with the principal details of construction of locomotives, and consists of a systematic course of shop visits carried on in various railroad shops in the vicinity. Preparation, course vi, engineering drawing.

Course XXXII. Railway design. *Senior ii and iii*, 192 hours.

(*a*) Of link and valve motions. Continuation of course xiv with special applications of the Stephenson link.

(*b*) Of locomotives and car details.

(*c*) Of the locomotive boiler.

(*d*) Of assembled parts. Preparation, course xxxii.

Course XXXIII. Locomotive construction. *Senior ii and iii*, 48 hours.

Lectures, reading and recitations on design and construction of locomotives, supplementing course xxxiv. This treats,—

(*a*) Of parts not involving the boiler and use of steam; but including the carriage, as frames, springs and equalizing arrangements, running gear, brakes, trucks, lubrication.

(*b*) Of locomotive boilers and connecting parts. Types, proportions, grates, flues, smoke-box arrangements and stacks. Riveted joints, bracing and staying. Lagging, smoke prevention.

(*c*) Of the locomotive engine. Details, heat insulation, cylinder proportions for various types, weight on drivers, special service; crank effort diagrams with inertia of reciprocating parts, cylinder and receiver ratios for compound engines; starting values for compounds.

Course XXXIV. Locomotive road testing. *Senior iii.*

FOR GRADUATES.

Courses are offered in:

Engineering design.

Experimental investigation.

Railway Engineering.

ELECTRICAL ENGINEERING.

Course I. Industrial electricity. *Junior i*, 24 hours.

Outline of industrial uses of electricity; application of Ohm's law; methods and calculation of wiring. Preparation required; physics, course i.

Course II. (*a*) (*b*) *Dynamos and motors.* *Junior ii and iii.* 84 hours.

Theory of electro-magnet and direct current dynamo and motor; methods of regulation; construction and operation of dynamos and motors; methods of testing. Preparation required; electrical engineering, course i; physics, courses i and ii (*a*); differential and integral calculus.

Course II. (*c*) *Electric laboratory.* *Junior ii and iii*, 120 hours.

Tracing circuits and locating faults; measurements of conductivity and insulation, construction and use of instruments; calibration of instruments; tests of batteries; operation of dynamos and motors: magnetization, characteristic and efficiency curves of dynamos. Preparation required; physics, courses i and ii (*a*), electrical engineering, courses i and ii (*a*).

Course III. Electric power. *Senior i*, 60 hours.

Elements of theory and practice of electrical measurements, wiring, dynamos, motors and electric lighting. 36 lectures and 48 hours laboratory. Preparation required: physics, course i and course ii or iii, For seniors in civil, mining engineering and metallurgy.

Course IV. Electrical design (*a*). *Junior iii*, 72 hours.

Problems in designing switches, electro-magnets and mechanisms; complete working drawings and specifications to accompany each design. Preparation required, physics, courses i and ii; electrical engineering, courses i and ii; machine design, course i.

Course V. (*a*) (*b*). *Alternating currents.* *Senior i and ii*, 96 hours.

Phenomena. measurement and use of alternating currents; elementary theory of transformer and alternator; methods of regulation; various types of commercial apparatus. Preparation required, physics: courses v and vi; electrical engineering, courses i and ii; differential and integral calculus.

Course V. (*c*.) *Electrical laboratory.* *Senior i and ii*, 100 hours.

Measurement of self and mutual induction; capacity and impedance; calibration of A. C. measuring instruments; curves from alternators and transformers; regulation and efficiency tests of alternators, transformers and A. C. motors; magnetic tests of iron. Preparation required: electrical engineering, courses i, ii and v (*a*).

Course VI. (*a*). *Electric lighting.* *Senior ii*, 24 hours.
Comparison of different sources of light; photometry, physics of the arc; history, design and regulation of arc lamps; adaptation to constant current, constant potential and A. C. circuits; carbons; history, manufacture and economy of incandescent lamps; distribution of lights. Preparation required: electrical engineering, courses i and ii.

Course VI. (*b*) *Electrical laboratory.* *Senior ii*, 24 hours.
Photometric and electrical tests of lamps; regulation and comparison of different arc lamps for constant current, constant potential and alternating currents. Preparation required; electrical engineering, courses ii and vi (*a*).

Course VII. Electrical design (*b*). *Senior ii*, 48 hours.
Design of a transformer, dynamo or other problem as assigned. Preparation required: electrical engineering, courses ii and iv.

Course VIII. Electric railways. *Senior ii*, 24 hours.
History and development; different systems of distribution, location and calculation of feeders; line and track construction; choice of motors, trucks, generators and engines; operation and repairs. Preparation required: electrical engineering, course ii; courses in thermodynamics and prime movers.

Course IX. Electrical transmission. *Senior iii*, 48 hours.
Utilization of natural forces: various methods of transmission; theory of electric motor; power distribution with constant current, constant potential and alternating systems; study of particular plants. Preparation required, electrical engineering, courses i, ii and v.

Course X. Central stations. *Senior iii*, 36 hours.
Preliminary surveys; choice of electrical systems; load diagrams; best units of power, comparison of steam, gas and water power: location and design of station; switch board; calculation, erection and maintenance of lines; erection of boilers, engines and dynamos; operation and regulation; maintenance of plant; emergencies; examination of stations in Minneapolis and St. Paul. 24 lectures for *senior iii*, electrical engineering. Preparation required: electrical engineering, courses ii, vi and viii; mechanical engineering, courses in thermodynamics and prime movers.

Course XI. Electrical design. (*c*), *Senior iii*, 96 hours.
(*c*) Designs, specifications and estimates of an electric light or power plant, or other approved problem. Preparation required: electrical engineering, courses iv and v.

Course XII. Batteries. *Senior i*, elective.
General theory of primary and secondary cells; types and methods of construction; commercial applications; operation of battery plants; construction and test of cells by students; test of a commercial plant. 36 hours in lecture room and laboratory. Preparation required: electrical engineering, courses iv and v.

Course XIII. Theory of alternating currents. *Senior i, ii, iii*, elective.
Mathematical discussion of the properties and applications of alternating currents. Phenomena of transmission lines, transformers generators, synchronous and induction motors and polyphase systems treated graphically and by complex quantities as developed by Steinmetz and others. Lectures and recitations one hour per week, first term, three hours second term and two hours third term. Open to electrical engineering seniors.

Course XIV. Journal reading. *Junior and senior*, elective
Discussion of current electrical periodicals. Two hours per week throughout the year.

Course XV. Electrical laboratory. *Senior i, ii, iii*, elective.
Efficiency tests and special problems.

Course XVI. Plant operation. *Senior ii*, elective.
Practice in operation and care of boiler, engines, motors, dynamos and circuits of the University lighting plant. Each senior spends one evening a week through the winter term.

Course XVII. Telegraph and telephone. *Senior ii*, elective.
Various systems and instruments used in local and long distance telegraphy and telephony, design and construction of switchboards and lines; protection from inductive and other disturbances; police, fire alarm and district messenger systems. 24 lectures with problems. Preparation required: electrical engineering, courses i, iv and v.

As an organization of the University of Minnesota, the college of engineering and the mechanic arts, has the general advantages of the University. Students find available all the resources of the institution so far as their technical lines will permit their use. For the information of those who are seeking to become acquainted with the methods of work in the various technical departments and the equipment in use for the prosecution of professional work, the following condensed statements are offered.

CIVIL ENGINEERING.

Geodesy. For this work the department has a secondary base-line apparatus, a three hundred foot standard steel tape, astronomical transits and repeating theodolites, heliotropes, a telemeter, deflection magnetometer, precise levels, two marine chronometers, one on sidereal and the other on mean solar time.

Highway engineering. The department has suitable apparatus for conducting the usual tests applied to road materials.

Railroad work. The usual equipment of transits, levels, planimeters, gradientors, level-rods, range-poles, chains and tapes, is provided.

Surveying. The department has for this work the necessary outfit consisting of compasses—plane, railroad and pocket, transits, tapes, hand levels, aneroid and mercurial barometers, solar compasses and solar attachments, pantometers and anemometers.

Structural engineering. The department has a large collection of working drawings of prominent structures throughout the country; photographs of bridges, buildings and roofs, in this country and abroad. It also has a series of nearly all the structural shapes manufactured by Carnegie Steel Co.; a series of models of the principal joints used in modern structures; models of arches of different forms; templets for cutting the stone used in the construction of skew arches; calculating machines, etc.

A new experimental laboratory in structural engineering has just been completed. This laboratory contains a large Olsen testing machine of two hundred thousand pounds capacity, with complete attachments, including automatic and autographic recording apparatus, extension head for full size columns ten feet long, and transverse beam for bending tests upon twenty foot beams. This is one of the most complete machines of its kind in the country.

The laboratory also contains an excellent equipment for the testing of cements, including a Riehlé cement testing machine, sieves, briquette moulds, damp closet, tanks and all other apparatus necessary for this work.

Topography. For this work the department has plane-tables, telemeter rods, stradia transits, reduction charts and slide rules, clinometers, pedometers. current-meters, compasses, a relief map, a complete topographic map of the District of Columbia, besides a large collection of topographic sheets presented by the U. S. coast and geodetic and geological surveys.

Library. The civil engineering library is located on the main floor of engineering building where are to be found all the more important books relating to this line of work. There are complete sets of the leading technical journals and proceedings, and reports of a large number of state and university engineering societies.

Reading room. Here are to be found all the leading American periodicals, and some foreign, relating to civil engineering. The files of the most important are bound and are easy of access to the student.

Methods of instruction. It is the aim of the department to secure for its students special training in the preparatory studies which form the basis of all engineering work—such as mathematics, physics, mechanics and drawing—these being the tools for the special engineering work which follows.

A thorough course is then given in the theory and practice of the more important professional lines such as railroad and structural engineering and topography. Considerable time is devoted to hydraulics, municipal engineering, higher surveying and geodesy.

While theory is at all times made prominent it is always accompanied by practice acccording to the methods followed in actual professional work.

Inspection tours. The professional work of the department is illustrated in a practical manner by frequent visits to the engineering works and plants in the vicinity of Minneapolis and St. Paul.

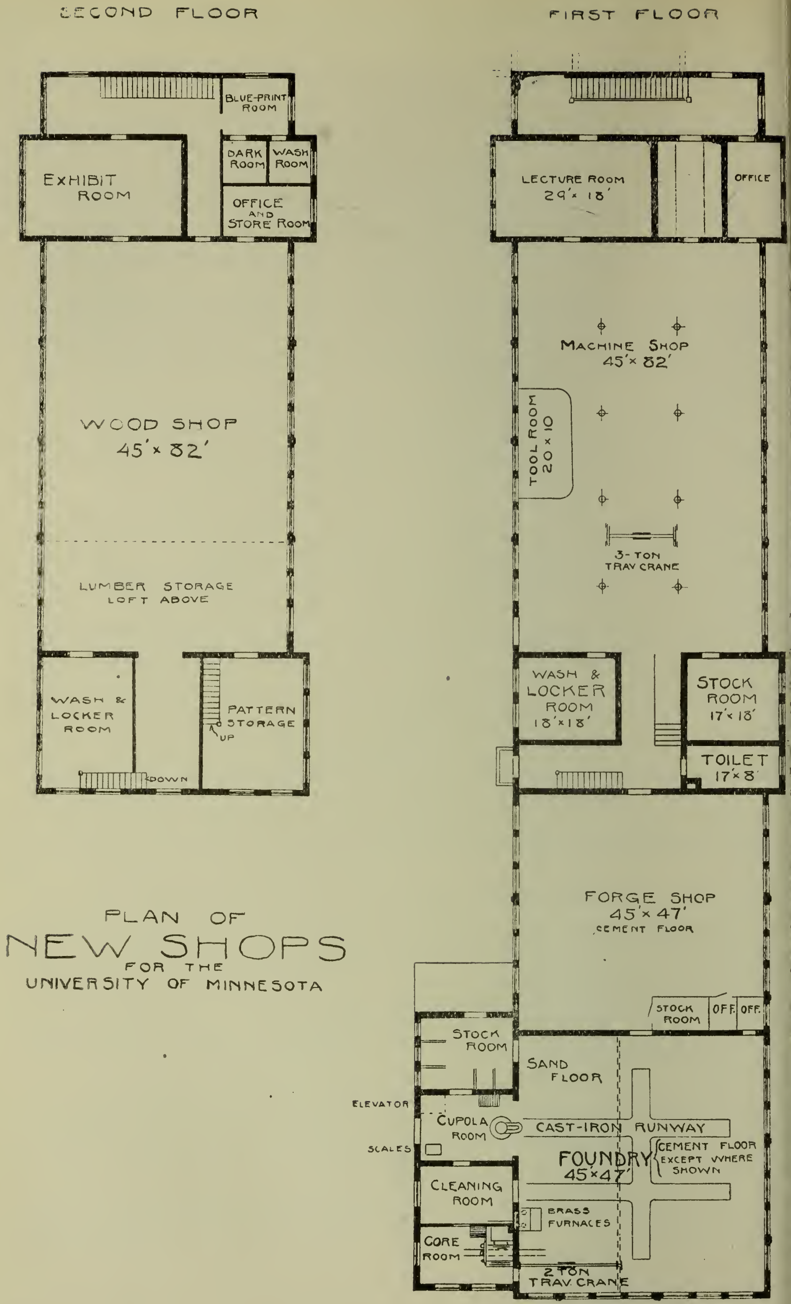
MECHANICAL ENGINEERING.

The plan of instruction in this course is intended to give the student a thorough training in mathematics and the physical sciences; and in the fundamental principles of engineering.

The work is planned to make him familiar with the various applications of these principles, and with the practical details of machine construction and design.

A new building, especially designed to meet the requirements of instruction in the various lines of shop work, has been erected during the past year, and it is believed that the increased facilities thus afforded for the prosecution of this work are unexcelled.

This building consists of a two-story portion, [containing the machine shop on the first floor and the wood shop on the second, as shown in the plan; beyond the machine shop and at a different level is the forge shop and foundry, both one story in height.



PLAN OF
NEW SHOPS
FOR THE
UNIVERSITY OF MINNESOTA

SECOND FLOOR
FIRST FLOOR
BLUE-PRINT ROOM
DARK ROOM
WASH ROOM
EXHIBIT ROOM
OFFICE AND STORE ROOM
WOOD SHOP 45' × 82'
LUMBER STORAGE LOFT ABOVE
WASH & LOCKER ROOM
PATTERN STORAGE
UP
DOWN
LECTURE ROOM 29' × 18'
OFFICE
MACHINE SHOP 45' × 82'
TOOL ROOM 20 × 10
3-TON TRAV CRANE
WASH & LOCKER ROOM 18' × 18'
STOCK ROOM 17' × 18'
TOILET 17' × 8'
FORGE SHOP 45' × 47'
CEMENT FLOOR
STOCK ROOM
OFF.
OFF.
STOCK ROOM
SAND FLOOR
ELEVATOR
CUPOLA ROOM
CAST-IRON RUNWAY
SCALES
FOUNDRY 45 × 47'
CEMENT FLOOR EXCEPT WHERE SHOWN
CLEANING ROOM
BRASS FURNACES
CORE ROOM
2 TON TRAV. CRANE

Slow-burning mill construction is used throughout. This consists of brick walls and heavy timbers which, in case of fire, burn slowly and are safer than the ordinary iron and timber combination for this class of buildings. An interesting feature is the construction of the floors, which are practically free from vibration, and give a very solid foundation for the machinery.

In the machine room a 3-ton crane will cover a clear span of 12 feet the entire length of the shop, thus giving ample space for erecting. This crane will also serve some of the larger machine tools.

The foundry has been the subject of especial study and possesses many features of interest and value. In accordance with the best modern practice for light work the floor is of concrete (except in one section as shown), and the gangways, leading from the cupola and extending lengthwise of the room, are of heavy iron plates set in cement.

A light traveling crane is also provided for the foundry. This has a span of 15 feet, and runs the entire length of the room.

The lighting, heating and ventilation of the building has received careful consideration. In the machine and pattern shops 60 per cent of the wall space above the benches is in glass. In the foundry and forge shop less light is allowed, since an abundant supply of overhead light is obtained from windows placed in the lantern or ventilator which extends over the roof. Pipe coils are employed in heating the building, and these are placed partly on the side walls under the windows and partly overhead. Electric power is used for driving the machinery. The group system has been selected as best adapted to the conditions, and a number of small motors are placed in the several departments: 220-volt continuous current motors are employed in connection with a three-wire system of distribution, which is also used in the lighting circuit.

The machine shop contains representatives of the ordinary machine tools, gauges, and small tools usually found in a well-equipped modern plant.

The shop for pattern making and general wood work contains benches with vises and tools, lathes and lathe tools, an improved universal sawing machine, band saw, planer, and other power tools, and all hand tools used in carpentry and pattern making.

The forge shop is equipped with stationary and portable forges, a blower and exhaust fan, a one hundred pound drop hammer, and the necessary small tools used in blacksmithing.

The foundry contains a thirty-inch Whiting cupola, and two brass furnaces, which embody some novel features. There are two core ovens; one for ordinary work 3½x3½x5 feet, and one 3½x7x6 feet for special cores which may be required. The feature of these core ovens is that the gasses and products of combustion are caused to traverse suitable conduits under a plate floor and do not come into direct contact with the cores. The usual moulding tools, ladles, crucibles, and all of the tools and material needed in moulding and casting iron, brass or white metal, are provided.

The shop work is intended, not so much to give the student skill in the manual operations of the respective crafts, as a knowledge of the methods and processes of practical construction.

The mechanical laboratory, in which the experimental research of the department is conducted, has been considerably enlarged and its equipment greatly increased. Two testing machines of 50,000 pounds and 100,000 pounds capacity, and three transverse testing machines are provided for determining the strength, ductility, resilience and other characteristics of the various materials used in engineering work under tensile, compressive, transverse and torsional stress. Several forms of absorption and transmission dynamometers are available for determining the power generated by engines or other motors, or absorbed by shafting or machinery; a Carpenter coal calorimeter for determining the heat value of coal, and apparatus for the analysis of flue gasses.

The laboratory is also provided with two machines for determining the lubricating qualities of oils and the relative values of metals used for journals and bearings; a mercury column and a Crosby direct pressure-gauge tester, for use in calibrating gauges and other pressure indicators. Besides the boilers in the university heating plant, there are in the laboratory, a 35 horse-power boiler and a high pressure boiler capable of carrying a working pressure of 300 pounds, with the necessary gauges, calorimeters, tanks and pyrometer, for making complete duty trials; several automatic steam engines equipped with condensers, indicators, brakes, scales and thermometers, which are employed to determine the efficiency in the use of steam under various conditions assumed or found in actual practice, and for valve setting and indicator work.

The operation and economy of other heat engines are illustrated by an Otto gas engine of five horse-power, a White gasoline engine of eight horse-power, a Rider two-cylinder and an Ericsson single cylinder hot air engine, a pulsometer, and steam pumps. The equipment also contains a Pelton and a Tuerk water motor, a water ram, injectors, weirs, nozzles, meters and other pieces of apparatus and instruments which an engineer is called upon to use in the course of his professional work.

A constantly increasing quantity of commercial testing is being done in connection with the regular work of the course which brings the student into actual contact with the engineering world and affords him valuable experience and data for his future work.

The library of the department contains a collection of historic and recent works, the best standard books being purchased as soon as issued. There are a number of complete files of the transactions of engineering societies and of the leading technical publications. The reading room is amply supplied with both the general mechanical and railway press.

Railway mechanical engineering. Courses have been arranged for students wishing to specialize in this subject. The various courses may be elected separately, subject to the requirements for previous preparation, to fill out the electives, or options in the regular senior year of any department.

Students planning to elect these courses are encouraged to work, under special arrangements, in railway shops during the summer vacations. This has proved its value as preparatory to the special work of the senior year. In every possible way the methods of the department are intended to place the student in touch with the best railway work; keeping always in sight the limitations which railway experience has found financially and practically to exist.

The location of the University is particularly favorable, being between the cities of St. Paul and Minneapolis in proximity to the shops, yards and headquarters of the extensive railway systems or the Northwest, which offer exceptional facilities for the prosecution of this work. The Northwest Railway Club, meeting monthly for papers and discussions, is open for the attendance of students, while several are enrolled as members.

Visits of inspection. During the year numerous visits are made to the manufacturing plants of Saint Paul and Minneapolis, which have proven to be of great value in supplementing the class room work

ELECTRICAL ENGINEERING.

The department of electrical engineering has recently been crowded out from its former quarters and is now housed temporarily in the armory, the chemical building and the new shop building. It is expected that the legislature now in session will make provision for suitable permanent quarters.

The laboratory equipment contains about thirty dynamo electric machines of various types and sizes, including direct current dynamos for constant potential and for constant current, direct and alternating current motors, single and two phase alternators. Several of the machines have sets of rings and brushes for obtaining single or multiphase alternating currents. Several have wiping contact devices for exploring magnetic fields, studying armature reactions, obtaining instantaneous values of alternating currents, etc. The alternator armatures may readily be coupled for high or low voltage as desired. Suitable switchboards allow ready combination of circuits. There is also a working equipment of primary and secondary cells, transformers, banks of incandescent lamps, arc lamps, adjustable absorption rheostats, cradle dynamometer, ammeters and voltmeters for direct and alternating currents, potentiometers, direct reading and recording wattmeters, galvanometers, secohm-meters, portable testing sets, condensers, carbon megohms, telephone instruments, arc and incandescent light photometers, a large variety of switches and other electrical supplies. The laboratory dynamo room is supplied with power by two motors of 10 horse power and 40 horse power, connected respectively with he University lighting plant and with the 500 volt power circuit of the Minneapolis General Electric Company. Alternating current from the same company is available for experimental work.

The laboratory is supplied with standards for measuring electro-motive force, current, resistance, capacity, self-induction and candle-power. The power equipment gives direct current up to 300 amperes and 1,500 volts and alternating current up to 100 amperes and 40,000 volts. A well equipped standardizing table allows frequent checking of the instruments and induces confidence in the accuracy of experimental results.

Reichsanstalt photometer with standards and accessories in a well-ventilated dark room gives excellent facilities for tests of arc and incandescent lamps. A Webber portable photometer allows the testing of street or other lamps *in situ* and of determining the illumination produced.

The libraries of the departments of physics and electrical engineering, now located in the armory, contain excellent collections of works relating to these subjects. New books and trade publications are being added continually. Files of twenty-two physical, electrical and street railway journals are nearly complete and others are being collected and bound. These, with the files in the general and other departmental libraries of the University, offer excellent facilities for research work.

The reading room receives regularly the leading American and foreign periodicals devoted to physics, electrical engineering, and allied interests. A journal club meets weekly for the discussion of current literature in mechanical and electrical engineering, keeping the students in touch with current progress and best modern practice, and teaching them the value of the technical press.

There is a growing collection of samples furnished by various manufacturers and dealers, a great help in exhibiting best modern practice and in teaching young engineers to appreciate the merits of different products. A collection of samples from repair shops and elsewhere is of especial value in illustrating the treatment received by apparatus in commercial use and the necessity of careful design and construction. Free access is given to the private libraries and collections of the professors.

Instruction. The course aims to give the students a knowledge of phenomena and principles and the various applications of electricity, the methods and instruments used in measuring and transforming it, and practice in the design and operation of electrical apparatus. Practice and theory are taken together as far as possible. During the junior and senior years, students have daily work with electrical instruments and apparatus and with commercial problems. Occasional inspection tours among the extensive and varied electrical interests in Minneapolis and St. Paul furnish excellent illustration. The University electric light and power plant, which is under the charge of this department, affords opportunity to observe commercial conditions at close range.

All engineering students are strongly advised to spend their vacations in factories, repair shops, electric light and railway stations, etc., in order to obtain commercial experience, and that they may better appreciate the relations of their technical training and actual work.

It is the aim to train the students to be independent and efficient workers, and to adopt the methods of professional engineers. Students are required to verify the formulas used in various calculations, and are encouraged to derive their own formulas for simplifying work in special cases. At the same time they are expected to use logarithms, slide rule, tables, curves, charts and all legitimate means for obtaining accurate results with least amount of drudgery.

Laboratory work. In the more advanced work students are encouraged to determine for themselves as independent workers the best methods and conditions for accurate results. While the laboratory work is classified, the students are treated individually and are advanced as rapidly as their attainments warrant.

In fitting up the laboratory, care is taken to secure representative types of apparatus of commercial style and size, in order to acquaint the students with actual practice. In putting up new lines and in setting up apparatus, the students are required to work in accordance with standard practice. Each student is given a certain amount of practice in the construction of electrical apparatus.

Design. The electrical engineers have drawing and design in common with the mechanical engineers in the first three years. A large number of numerical problems are given during the course. During the junior and senior years, electro-magnets and mechanisms, dynamos and motors, lines, switches, switchboards and plants are designed. Complete working drawings and specifications for some special problem are elaborated. A file of nearly 600 blueprints and drawings in the department library in addition to those in other deparments is available to the students.

DRAWING AND INDUSTRIAL ART.

This department occupies rooms in the mechanic arts building and Pillsbury hall. The equipment of models and illustrative material is quite extensive and embraces among its many collections the following: A complete set of Schroeder models for descriptive geometry; a collection of casts of architectural details and historic ornament; full length figures and busts of historic and classic sculpture, and collections of charts, prints and drawings. There is also a small library of standard works.

The course in industrial art is carefully outlined with a view to the gradual and progressive development of art training. The work in design is not entered upon until the beginning of the second year. It is essential that a thorough knowledge of drawing in all its varied aspects and mediums should form the foundation of all decorative and industrial art. After such knowledge is acquired, every facility will be afforded students for pursuing the line for which their work shows especial aptitude. The course of study is arranged to enable the student to pursue one of three lines of work; regular art, design, and normal art.

COURSE OF STUDY.

FRESHMAN YEAR.

Through the year.
Language or science, [4].
English (or rhetoric), [4].
Drawing, [4].
Drawing, [4].
Lectures and reading, [1].

SOPHOMORE YEAR.

Language or history, [4].
Science or language or psychology and logic, [4].
Drawing or pedagogy, [4].
Design or drawing, [4].
Rhetorical work, [1].
Lectures and reading, [1].

JUNIOR YEAR.

Archæology (i, ii) and arts lects., (iii) [4]
Pedagogy, or elective, [4].
Design or drawing, [4].
Drawing, [4].
Lectures and reading, [1].

SENIOR YEAR,

Elective, [4].
Drawing or Elective, [4].
Design or drawing, [4].
Painting or modeling, [4].
Thesis.

LIBRARIES AND READING ROOMS.

The reference and the seminar libraries, of the several departments of instruction, are well supplied with technical literature. In the engineering building, is a library consisting chiefly of books devoted to civil and mechanical engineering, comprising over one thousand volumes; the library of the department of engineering and mechanics numbers eighteen hundred volumes of choice mathematical and scientific works; the departments of electrical engineering and physics together have an excellent collection of standard works which numbers over fourteen hundred volumes; the chemistry library contains over five hundred technical works; the department of drawing and industrial art possesses a choice collection of between one hundred and two hundred volumes relating to drawing, art and design. The above number upwards of four thousand volumes, comprising many works which are the private property of professors, yet accessible to the students.

In addition to the above are the large libraries of the University, the City of Minneapolis, the Minneapolis Athenaeum, the Minnesota Academy of Natural Sciences, the City of St. Paul and others, containing many works of value to the engineering and scientific student. The standard works bearing on special subjects are secured as they appear. The more important scientific and technical periodicals are secured and placed in the reading rooms maintained in connection with the several departments of the college.

Journal clubs are organized, in most of the departments, for the discussions of current technical literature, relating to the best modern practice. Thus students are kept in touch with the development along engineering lines and are taught how to use the technical press.

In addition to the foregoing, the college has many periodicals donated by the societies publishing them, and others loaned by members of the faculty, who at all times place their periodical list and entire professional libraries at the disposition of the students. Still others are secured by exchanging the publications of the University and the Yearbook of Society of Engineers.

THE SOCIETY OF ENGINEERS.

This society is an organization, holding regular meetings for the purpose of discussing topics of current interest, hearing reports and lectures from members of the faculty and others. During the past year the special lecturers of the college have delivered their lectures under the auspices of this society. A Yearbook of the society is published, which presents the progress of the original work done both by instructors and students.

THE GILLETTE-HERZOG PRIZES.

The Gillette-Herzog Manufacturing Company, of Minneapolis, offers for competition by the students of the college of engineering and the mechanic arts:

A first cash prize of seventy-five dollars, accompanied by a gold medal.

A second cash prize of fifty dollars, accompanied by a gold medal.

A third cash prize of twenty-five dollars, accompanied by a gold medal.

Under satisfactory conditions the following subjects are admitted:

I. Civil engineering. (*a*) Structural engineering, as seen in the construction of fire-proof buildings, bridges and iron and steel structures generally.

(*b*) Municipal engineering, as exhibited in the problems of water supply and distribution and street pavement.

(*c*) Railroad and highway engineering, as safety switches, systems of block signalling, also machinery for highway construction and maintenance.

II. Mechanical engineering, as seen in machine design or process of construction; elevators or hoists; stationary or traveling cranes; motor wagons; heating systems and smoke prevention; power generation transmission or distribution; refrigerating machinery and plans of manufacturing plants.

III. Electrical engineering. (*a*) The use of electric lights, motors, magnets and heaters.

(*b*) The design of dynamos, motors and transformers.

Honorable mention of any theses and designs of special merit, not awarded prizes may be made by the judges.

THE BRIGGS PRIZE.

For the encouragement of studies in foundry practice, Mr. O. P. Briggs President of the Twin City Iron Works, offers $75 annually in two prizes which are to be accompanied by gold medals.

The competition is open to sophomores in the college of engineering and the prize will be awarded for the best essay relative to the above subject.

Essays should contain about 3000 words, and must be submitted to the professor of rhetoric on or before May first.

THE MINNEAPOLIS TIMES "GOOD ROADS" PRIZES.

The Times Newspaper Company offers, for competition, to the sophomores of the department of civil engineering, three gold medals for the best "essays" or "studies" in good roads.

First prize—A fifteen dollar gold medal.

Second Prize—A ten dollar gold medal.

Third prize—A five dollar gold medal.

The conditions for competition are as follows:

The essays are to be on some phase of the "good road" question, to be approved by the department. Papers to contain about two thousand words The good roads "studies" must be of some actual condition of roads in the State of Minnesota.

All papers submitted for competition must be in the hands of the department one month before the date set for commencement. Prizes will be awarded by a committee of three, consisting of a representative of the Times, the department of civil engineering, and a third to be named by these two. Announcement of winners of prizes will be made at commencement,

THESES.

Theses. Each member of the senior class in this college, in addition to the final examination, must prepare a thesis on some subject particularly relating to his course. This paper must contain some original research made by the student himself. It must be creditable from a literary as well as from a technical point of view.

Theses shall be written in a clear hand, or typewritten; the paper used shall be of the standard size and quality adopted by the University; all charts, maps, drawings or other illustrative matter shall be presented on tracing cloth or bond paper; the whole shall be suitably bound and a copy deposited in the library of the University. The subject of the thesis must be submitted to the head of the department in which the student is a candidate for a degree, and the work of preparation must be formally begun by the beginning of the second term of senior year. During the third term the student is expected to devote at least ten hours a week to preparation of his thesis.

The subject of the thesis and the character of the work to be done upon it will be suggested in a large measure by the course of study pursued by the student. Great emphasis is laid upon the careful and accurate preparation of the thesis; because, more than any other work the undergraduate does, this certifies to his ability to undertake the difficult and responsible duties involved in the direction of engineering and industrial interests. The thesis must be completed and put in the hands of the faculty as early as the senior examination week of the third term.

Courses in Science and Technology.

It is very desirable that engineering students taking one of the courses leading to the professional degree, civil engineer, mechanical engineer, or electrical engineer, should have a more liberal education than can now be obtained in the regular four years' course. This has led to the establishment of a five years' course in science and technology in which a student in the college of engineering may obtain more English and general culture studies, as well as more extended work in the technical sciences than has been offered heretofore. This course does not diminish in any way the regular courses in engineering—the work is merely distributed over a more extended period. Every subject now included in any one of the regular engineering courses is also included in the corresponding five years' course, and in addition to these there is the equivalent of one years' work in more general subjects.

At the end of the fourth year the degree, bachelor of science in engineering is conferred. The professional degree, civil engineer, mechanical engineer, or electrical engineer, is granted upon the completion of the fifth year, provided the choice of electives throughout the course has satisfied the requirments of the proposed engineering degree.

COURSE IN SCIENCE AND TECHNOLOGY.

FRESHMAN YEAR.

Engineering mathematics, 5.
English, 4.
French or German, 4.
Chemistry or history, 4,
Military drill, 2.

SOPHOMORE YEAR.

Engineering mathematics, 5.
History, chemistry, French, German, or English, 4.
Physics, 4.
Engineering drawing, 4.
Rhetoric, 1.
Military drill, 2.

JUNIOR YEAR.

FIRST TERM	SECOND TERM.	THIRD TERM.
Mechanics, 5.	Mechanics, 5.	Hydraulics, 5.
Physics, 4.	Physics, 4.	Elective, 4.
Engineering drawing, 4.	Engineering drawing, 4.	Technical work, 4.
Technical work, 2.	Technical work, 2.	Technical work, 2.
Elective, 4.	Elective, 4.	Elective, 4.
	Technical work, 3.	Physics, 2.

SENIOR YEAR.

Technical work, 5.	Technical work, 5.	Technical work, 2.
Technical work, 4.	Technical work, 3.	Technical work, 2.
Elective, 4.	Elective, 4.	Elective, 4.
Elective, 4.	Elective, 4.	Elective, 4.
Elective, 4.	Elective, 4.	Elective, 4.
		Elective, 4.

POST SENIOR YEAR.

The work of the post senior year is entirely elective, and consists of twenty exercises or recitations per week, selected from the following list, The only limitation imposed is that subjects cannot be chosen unless the work leading up to, and preparing for such subjects has been completed.

The following electives are offered:

In science:—Chemistry, physics, geology, mineralogy, astronomy and mathematics.

In technology:—Shop practice, engineering laboratory, drawing, design, specifications, measurement and transmission of power, steam boilers, railway engineering, shop economics, water supply engineering, sanitary and municipal engineering, bridge engineering, surveying, alternating currents, telephony and telegraphy, electric light, plant operation, central stations.

In literature and the arts:—English, French, German, history, political science and logic.

The subjects required for the completion of the five years' course will depend upon the particular professional degree desired. Thus for the course in science and technology leading to the degrees bachelor of science at the end of four years, and the professional degree at the end of the fifth year, the electives would be selected as follows:

FRESHMAN YEAR.

Mathematics, 5.
English, 4.
French or German, 4.
Chemistry or history, 4.
Military drill, 2.

SOPHOMORE YEAR.

Mathematics, 5.
History or chemistry, 4 (one year of chemistry is required).
Physics, 4.
Engineering drawing, 4.
Rhetoric, 1
Military drill, 2.

JUNIOR YEAR.

FIRST TERM.

CIVIL ENGINEERING.

Mechanics, 5.
Physics, 4.
Engineering drawing, 4.
Materials of engineering, 2.
Topography, 4.

MECHANICAL AND ELECTRICAL ENGINEERING.

Mechanics, 5.
Physics, 4.
Engineering drawing, 4.
Materials of engineering, 2.
Shop practice, 4.
Industrial electricity, 2.
or
Stresses, 3.

SECOND TERM.

Mechanics, 5.
Physics, 4.
Engineering drawing, 4.
Surveying, 3.
Engineering instruments, 4.

Mechanics, 5.
Physics, 4.
Engineering drawing, 4.
Mechanism, 2.
Shop practice, 5.
Dynamos and motors, 3.

THIRD TERM.

Hydraulics, 5.
Freshman surveying, 4.
Higher surveying, 4.
Field work, 3.
Field work, 2.
Physics, 2.

Hydraulics, 5.
Dynamos and motors, 4.
Kinematics, 4.
Mechanism, 2.
Electrical laboratory, 5.
Physics, 2.

SENIOR YEAR.

FIRST TERM.

CIVIL ENGINEERING.

Curves and earth work, 3.
Geology, 2.
Field work, 4.
Electric power, 5.
Elective, 4.
Stresses, 3.

MECHANICAL AND ELECTRICAL ENGINEERING.

Thermodynamics, 5.
Machine design, 4.
Shop practice, 10.
Elective, 2.

SECOND TERM.

Stresses, 4.
Materials of engineering, 2.
(Mechanical laboratory).
Highways, 3.
Geology, 2.
Water supply, 4.
Machine design, 4.

Prime movers, 3.
Gas engines, 2.
or
Elective, 2.
Steam engines, 3.
Machine design, 4.
Shop practice, 5.
Elective, 2.
Mechanical laboratory, 2.

THIRD TERM.

Structural design, 4.	Mechanical laboratory, 2.
Railroad work, 5.	Machine or electrical design, 4.
or	Shop practice, 10.
Municipal engineering, 4.	Elective, 2.
Practical astronomy, 3.	Compressed air, 3.
Least squares, 2,	or
Sanitary engineering, 3,	Elective, 3.
Elective, 3.	

POST SENIOR YEAR.

FIRST TERM.

CIVIL ENGINEERING.	MECHANICAL ENGINEERING.	ELECTRICAL ENGINEERING.
Masonry, 5.	Machine design or railway design, 4.	Alternating currents, 4.
Structural design, 5.	Steam boilers, 2.	Electric laboratory, 3.
Elective, 8.	Measurement of power, 2.	Mechanical laboratory, 3.
Experimental laboratory, 2.	Mechanical laboratory, 3.	Elective, 8.
Political science, 2.	Elective, 8.	Political science, 2.
	Political science, 2.	

SECOND TERM.

Structural design, 5,	Machine design or railway design, 4.	Alternating currents, 4.
Railway economics, 3.	Electric light or electric railway, 2.	Electric light, 2.
Arches, 3.	Electrical laboratory, 2.	Electrical laboratory, 3.
Elective, 4.	Mechanical laboratory, 4.	Plant operation, 2.
Experimental laboratory, 2.	Elective, 4.	Electric railway or electric design, 2.
Elective or thesis, 2.	Elective or thesis, 2.	Elective, 4.
Political science, 2,	Political science, 2.	Thesis, 1.
		Political science, 2.

THIRD TERM,

Contracts, 2.	Contracts, 2.	Contracts, 2.
Geodesy, 3.	Machine design or railway design. 4.	Electrical design, 5.
Field work, 3.	Compressed air, 2.	Electrical transmission, 4.
Swing bridges, 4.	Mechanical laboratory, 4.	Central stations, 3.
Elective, 4.	Elective, 4.	Elective, 2.
Thesis, 4.	Thesis, 4.	Thesis, 4.
Political science, 2.	Political science, 2.	Political science, 2.

As the strictly professional courses offer little opportunity for specialization in the physical and technical sciences, and the liberal culture studies are necessarily very limited in such courses, the general course in science and technology affords an opportunity for more extended work in physics, chemistry and other sciences, together with additional studies in English, history, political science and similar subjects.

While the choice of electives in the general course in science and technology is very liberal there is necessarily less freedom in the selection of subjects in those courses which lead to the engineering degrees.

For the first two years no electives are offered and the work is common to the general and the five years' professional courses.

While the student is allowed to make his own selection of electives in the general course, subject to known requirements, the following is suggested as a representative non-professional technical course leading to the degree, bachelor of science in engineering, at the end of four years:

A FOUR YEARS' GENERAL COURSE IN SCIENCE AND TECHNOLOGY.

FRESHMAN YEAR.	SOPHOMORE YEAR.
Mathematics, 5.	Mathematics. 5.
English, 4.	History, chemistry or language. 4.
French or German, 4.	Physics, 4.
Chemistry or history, 4.	Engineering drawing, 4.
Military drill, 2.	Rhetoric, 1.
	Military drill, 2.

JUNIOR YEAR.

FIRST TERM.	SECOND TERM.	THIRD TERM.
Mechanics, 5,	Mechanics, 5.	Mechanics, 5.
Physics, 4.	Physics, 4.	*Physics. 4.*
Engineering drawing, 4.	Engineering drawing, 4.	Engineering drawing, 4 or surveying, 4,
Materials of engineering, 2.	Mechanism, 2 or surveying, 3.	Mechanism, 2 or field work, 2.
Chemistry, 4.	*Chemistry, 4.*	*Chemistry, 4.*
	Mechanical laboratory, 2.	Electrical laboratory, 3.

SENIOR YEAR.

Thermodyamics, 5. or mineralogy, 4.	Prime movers, 3. or geology, 4.	Mechanical laboratory, 2. or astronomy, 4.
Industrial electricity, 2.	Steam engine, 3. or highways, 3.	Steam engine, 3. or astronomy, 4.
Physics, 4.	*Physics, 4.*	*Physics, 4.*
Political science, 4.	Political science, 4.	Political science, 4.
Elective, 4.	Elective, 4.	Elective, 4.

The required subjects are printed in Roman type; the electives, printed in italics, may be replaced by others selected from the general list.

THE
SCHOOL OF MINES.

The School of Mines

OFFICERS

CYRUS NORTHROP, LL. D., *President.*

OFFICERS OF THE DEPARTMENTS OF MINING AND METALLURGY

WILLIAM R. APPLEBY, M. A., *Dean and Professor of Metallurgy.*
CHARLES E. VAN BARNEVELD, B. A. SC., E. M., *Professor of Mining Engineering.*
PETER CHRISTIANSON, B. S., E. M., *Instructor in Metallurgy.*
BENJAMIN F. GROAT, *Instructor in Mathematics and Mechanics.*
EDWARD P. MCCARTY, E. M., *Instructor in Mining.*

OFFICERS OF THE DEPARTMENT OF GEOLOGY AND MINERALOGY

CHRISTOPHER W. HALL, M. A., *Professor of Mineralogy and Geology.*
CHARLES P. BERKEY, Ph. D., *Instructor in Mineralogy.*

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GEORGE D. FRANKFORTER, Ph. D., *Professor of Chemistry.*
CHARLES F. SIDENER, B. S., *Assistant Professor of Chemistry.*
EDWARD E. NICHOLSON, M. A., *Assistant Professor of Chemistry.*

OFFICERS OF THE DEPARTMENT OF ELECTRICAL ENGINEERING

GEORGE D. SHEPARDSON. M. A., M. E., *Professor of Electrical Engineering.*
FRANK W. SPRINGER, M. E., *Assistant Professor of Electrical Engineering.*

OFFICERS OF THE DEPARTMENT OF MECHANICAL ENGINEERING

JOHN J. FLATHER, Ph. B., M. M. E., *Professor of Mechanical Engineering.*
HARRY E. SMITH, E. E., *Assistant Professor of Mechanical Engineering.*

OFFICERS OF OTHER DEPARTMENTS GIVING INSTRUCTION

FREDERICK S. JONES, M. A., *Professor of Physics.*
WILLIAM H. KIRCHNER, B. S., *Assistant Professor of Drawing.*
JOHN ZELENY, B. S., B. A. Res., *Assistant Professor of Physics.*

ADMISSION

Examinations for admission will be held at the beginning of the year. See calendar and program of examinations.

Students prevented from entering at the beginning of the year may be admitted at a subsequent date, when circumstances may justify this action. Such students are at a great disadvantage. Students expecting to enter the school are urged to be present at the beginning of the year.

All applicants should present themselves to the registrar, who will furnish them with application blanks and directions covering examinations and registration.

GENERAL REGULATIONS GOVERNING ADMISSION.

I. Students will be admitted to the freshman class on **passing the regular entrance examinations.**

II. No student will be admitted **if conditioned in more than three half-year subjects,** or their equivalent.

III. Graduates of any Minnesota State high school will be admitted **without examination, provided—**

(1) That the school maintain a **full four-year course** of high school work.

(2) That the applicant present to the registrar the principal's certificate showing the satisfactory completion **of all the studies required for admission** to the desired University course.

IV. Graduates of Minnesota State high schools, who are deficient in **not more than three half-year subjects,** or their equivalent, **may be excused** from entrance examinations **in such subjects as the enrollment committee may decide;** such candidates should present themselves to that committee **not later than Tuesday of examination week.**

V. Graduates of Minnesota State high schools whose principal's certificate shows them to be deficient in **more than three half-year subjects,** or their equivalent, even though they have made such additional preparation as they deem necessary, must take, nevertheless, the regular entrance examinations in all subjects, as provided in sections I and II, unless excused by vote of the faculty; and persons wishing to present reasons for such excuse **should report to the enrollment committee not later than Tuesday of examination week.**

VI. Graduates of the **advanced courses of Minnesota normal schools** will be admitted upon the same terms as graduates of State high schools.

VII. Any Minnesota high school or academy **not under supervision of the State High School Board,** but requiring for graduation **a four-years' course,** exclusive of the common school branches, conforming **essentially in distribution of time** to the entrance requirements of at least one of the University courses, will, upon application, be inspected by a committee, and, after favorable recommendation, **may be accredited by the faculty** in all respects as are the state high schools, **provided,—**

(1) That the school be **open to inspection** at any time by the University, and

(2) That it take such **supplementary examinations as may be prescribed** from time to time.

VIII. Graduates from schools in other states, whose diplomas admit to **reputable colleges,** will be received subject to the regulations that apply to graduates of Minnesota State high schools.

XI. Applicants from schools not coming within any of the above classes **must take the regular entrance examination,** or present State High School Board certificates.

In all cases the faculty reserves the right to require a student to take supplementary examinations, if he does not sustain himself creditably in his course.

The enrollment committee will meet every day during the week commencing Sept. 3rd, in room 24, Pillsbury Hall, at 9 o'clock a. m.

REQUIREMENTS FOR ADMISSION TO THE FRESHMAN CLASS

N. B.—Time element, as indicated with each subject, is essential.

A three years' course of reading in English classics.

English Composition, one year.

Algebra, elementary, one year.

Geometry, plane, one year.

Geometry, solid, one-half year.

Chemistry, one year.

In addition to the above named required subjects, for which no substitutes will be accepted, the student shall present evidence of having completed work in any of the following subjects, entitling him to seven year-credits.

- **Astronomy.**
- **Botany.**
- **Civics.**
- **Drawing.**
- **English.**
  - Latin element.
  - Literature.
- **French.**
  - Grammar.
  - Literature.
- **Geology.**
- **Greek.**
  - Grammar.
  - Anabasis.
- **German.**
  - Grammar.
  - Literature.
- **History.**
  - Greece and Rome.
  - England.
  - Modern.
  - Medieval.
  - Senior American.

Latin.
    Grammar.
    Cæsar.
    Cicero.
    Vergil.
Physics.
Physiography.
Political economy.
Shopwork.
Zoology.

Advanced Standing—**The University accepts records from all reputable colleges for credit to advanced standing.** Such records are accepted so far as they are equivalent to the work done in the University.

Records from institutions whose entrance requirements are not essentially equivalent to the requirements of the University, will not be accepted unquestioned; the credit to be allowed will be decided in individual cases by the enrollment committee.

DAILY ROUTINE

The morning session begins at 8:30 o'clock; a general assembly of the faculty and students is held each day at 10:25 o'clock, at which there are brief and simple religious exercises.

EXAMINATIONS

In order to pass, students must receive a yearly average of 75 per cent in each subject.

Students failing to pass in one or more subjects will be given supplementary examinations in those subjects, providing their general average in all subjects during the year does not fall below 60 per cent.

Supplementary examinations will be held Sept. 3d to Sept. 9th.

Students whose average mark for the year falls below 60 per cent, or students failing to pass any supplementary examination will be required to repeat in class the entire year's work.

Students whose absences in any term exceed four weeks in the aggregate, are not permitted to take the term examinations without special permission of the faculty.

UNCLASSED STUDENTS

No unclassed students will be admitted to the School of Mines.

GRADUATION

Students completing courses of study to the satisfaction of the faculty, are entitled to receive the appropriate degrees. Any person may undergo, at suitable times, examination in any subject; and if such person pass in all the studies and exercises of a course, he is entitled to the appropriate degree, **provided,** that at least one full year be spent at the University before such degree shall be granted, and **provided** the examination in every case be held before a committee of the faculty appointed for that purpose.

Special Statements.

In the School of Mines there are two regular courses of study, viz.: Mining Engineering and Metallurgy; leading to the degree of Engineer of Mines (E. M.) and Metallurgical Engineer (Met. E.) respectively.

The degree of Met. E. may be conferred upon a candidate holding the degree of E. M. and vice versa, provided such a candidate complete an additional year's work at the school and present a suitable thesis.

Candidates for advanced standing must pass a satisfactory examination for admission and also upon those studies which have been pursued by the class they propose to enter.

Students from other institutions will be admitted to such standing as their credentials or the examinations taken under the direction of the faculty of this school may entitle them.

Students in the college of science, literature and the arts, in the college of engineering and mechanic arts, and school of technical and applied chemistry, who contemplate taking a degree in this school after completing their course, are recommended to select their electives with reference to as full a preparation as possible for the technical work of the course they purpose to enter.

FEES

A registration fee of five dollars is required at the beginning of each term.

The various laboratory fees are as follows:

Chemical laboratory	per term,	$5.00
Mineralogical "	"	2 00
Assaying "	"	5.00
Physical "	"	2.00
Mechanical "	"	3.00
Electrical "	"	5.00
Ore testing "	"	5 00

The visits to the mines made by the sophomore and junior classes cost the student between seventy and eighty dollars per visit.

Books cost about as follows:

Freshman year	$12.00 to $15.00
Sophomore "	5.00 to 8.00
Junior "	18.00 to 25.00
Senior "	10.00 to 30.00

A number of books are recommended to the student, but the purchase of them is optional. The lower estimates given will cover the cost of books that must be purchased.

A set of draughting instruments must be purchased by the freshman class. The necessary instruments will cost about eight dollars.

SUMMARY OF EXPENSES

FRESHMAN YEAR

Matriculation fee	$15.00
Chemical laboratory fee	15.00
Mineralogical laboratory fee	4.00
Physical laboratory fee	2.00
Assaying laboratory fee	10.00
Books	13.00
Draughting instruments	8.00
Note books and supplies	2.00
	$69.00

SOPHOMORE YEAR

Matriculation fee	$15.00
Chemical laboratory fee	15.00
Physical laboratory fee	6.00
Visit to the mines	$70.00 to 80.00
Books	7.00
Note books and supplies	2.00
	$125.00

JUNIOR YEAR

Matriculation fee	$15.00
Visit to the mines	$70.00 to 80.00
Books	20.00
Note books and supplies	2.00
Chemical laboratory fees	15.00
	$132.00

SENIOR YEAR

Matriculation fee	$15.00
Electrical laboratory fee	5.00
Ore testing laboratory fee	10.00
Mechanical laboratory fee	3.00
Books	20.00
Note books and supplies	2.00
	$55.00

Good board can be obtained at a cost varying from $2.50 to $4.00 per week.

Room rent varies from $5.00 to $10.00 per month.

With two occupying one room, the rent per student would be considerably lower.

ORGANIZATION.

The organization of the School of Mines dates back to 1889, when the general faculty of the University recommended to the Board of Regents its establishment. In 1891 the Legislature of the State of Minnesota voted an appropriation for establishing and equipping the school. Two annual appropriations have since been made for its support.

LOCATION.

The University of Minnesota is located in the city of Minneapolis, on the east bank of the Mississippi river. The School of Mines has its buildings and laboratories on the same ground. Students of the School of Mines have, therefore, all the opportunities afforded by a large university.

Minneapolis is surrounded by and is in direct communication with several important mining and smelting districts. As the city is a railroad center, transportation at special rates is readily obtained.

Field work is conducted at the iron mines in the northern part of this state, in the copper and iron regions of Michigan, in the mines and smelters of Montana and Colorado, and in the coal mines of Pennsylvania.

At least two of these districts will be visited by each class, affording splendid opportunities for study and observation.

LIBRARY.

The library consists of about eight hundred volumes. This number represents only those works that treat directly of mining and metallurgical subjects.

This school has a complete set of the leading mining and metallurgical journals, and other similar books of reference. The students have also access to a very complete private library, as well as the Minneapolis public library, which contains an exceptionally large and valuable set of publications on subjects relating to mining and metallurgy. The leading periodicals are accessible to all. Constant references in lectures compel the student to keep himself well informed as to the latest methods, machinery and changes in practice going on in his special line of work.

In addition to the above, many thousand volumes on chemistry, mineralogy and geology complete a most valuable working and reference library. A card index is kept of all articles of value and interest appearing in the leading periodicals.

PHOTOGRAPHY.

Photographs of surface and underground appliances, metallurgical plants, copies of drawings and other photographs are indispensable to the study of mining and metullurgy. With the report of his field work every student is expected to present photographs, as well as sketches, of various objects under consideration. There is also a very complete set of lantern slides illustrating the principal methods of underground workings and metallurgical plants, at home and abroad. Several hundred slides have been made in the department's laboratory which bear directly on the work done in Minnesota and the neighboring northwest. Many valuable photographs are constantly being made. Blue prints of these are given students as illustrations. Much time is thus saved usually spent in making sketches and diagrams.

The work falls under the following subdivisions, supplemented by thorough courses in physics, chemistry, mineralogy and geology:

(*a*) *Assaying*—to determine if ore has value for treatment. (*b*) *Mining engineering*—to furnish material for treatment. (*c*) *Ore testing*—to determine best method of treatment. (*d*) *Ore dressing*—furnishing products for metallurgical treatment. (*e*) *Metallurgy*—smelting and refining of ores and ore dressing products; reduction to metals.

DEPARTMENT OF MINING ENGINEERING

Mining engineering extends through sophomore, junior and senior years, and the subjects given, together with the sequence necessary, are stated in the accompaning outline of the course.

Until the second term of the junior year, the course consists of lectures and recitations only. In the subsequent work, text-books are used in connection with the lectures.

In the senior year, problems in hoisting, hauling, pumping, ventilation and similar subjects become an important part of the work.

Field work in mining. At the close of the sophomore year the students are required to spend four weeks in some mining district studying the work performed by the miners.

At the close of the junior year a second visit is made for the purpose of making mine and geological surveys and studying mining methods.

All field work must be taken at time specified.

A complete type-written report, covering each year of field work, illustrated with sketches drawn to scale, must be submitted by the student. This report must be submitted before the student may register for the following year's work.

Designs and specifications. The student makes working drawings of mine cars, skips and other parts of mine equipment that are usually designed and made on the ground.

Mine surveying. The work in surveying is designed solely for mining engineers. In the freshmen year, third term, the work consists of the elements of plane surveying with special reference to the computations necessary.

Field work in surveying—Course IX. The month of August, following the close of the freshman year, is spent in practicing plane surveying. About an hour per day is given to lectures or recitations and the remainder of the day to field work.

The students are divided into squads of two, and each is required to complete the following exercises and surveys:

1. Ranging.
2. Chaining.
3. Compass reading.
4. Determination of length of pace.
5. Survey of a large area by pacing and hand compass.
6. Adjustment of hand levels and practice in leveling.
7. Adjustment and use of wye levels.
8. Adjustment of mining transit.
9. Reading angles.
10. Traverse with steel tape.
11. Azimuth traverse with stadia.
12. Survey of mining claim according to the regulations of the U. S. Government.
13. Measurement of earthwork.
14. Laying out railroad tangents, curves and crossings.

Each squad must provide itself with a 25-foot steel tape, graduated to tenths.

This course is open only to those who have taken Course VIII, or its equivalent, and must be completed before Sophomore year.

During the first term of the junior year the higher theoretical work in plane and mine surveying is studied. During second term mine mapping is practiced. While visiting the mines in junior year, a survey of a mine, or some part of a mine is actually made and the survey platted.

Surveying instruments of the latest and best makes are furnished students on these surveys.

Ore dressing. The lectures and recitations in ore dressing extend through the second and third terms of junior year, and comprise the detailed study of ore dressing and concentrating machinery, together with the study of typical combinations of dressing machines as found in the several mining districts of the United States.

In connection with the theoretical work, the ore dressing and testing plant of the school is utilized for practical illustrations.

During the coming year, experimental work in ore concentration will be conducted.

COURSE IN MINING ENGINEERING

FRESHMAN YEAR

FIRST TERM

Chemistry (Chemistry I)—4[2] hours, Professor Nicholson.
Drawing (Drawing I)—4[2] hours, Professor Kirchner.
Mathematics (Mathematics I)—5 hours, Mr. Groat.
Mineralogy (Geology and Mineralogy, Mineralogy I)—4[2] hours, Professor Hall and Dr. Berkey.

SECOND TERM

Assaying (Metallurgy I)—2 hours, Professor Appleby.
Assaying (Metallurgy I)—2^2 hours, Professor Appleby and Mr. Christianson.
Chemistry (Chemistry II)—4^2 hours, Professor Nicholson.
Constructive Geometry (Drawing II)—5^2 hours, Professor Kirchner.
Mathematics (Mathematics I, II)—5 hours, Mr. Groat.
Mineralogy (Geology and Mineralogy, Mineralogy II)—4^2 hours, Professor Hall and Dr Berkey.

THIRD TERM

Assaying (Metallurgy I)—2 hours, Professor Appleby.
Assaying laboratory (Metallurgy I)—4^2 hours, Professor Appleby and Mr. Christianson.
Chemistry (Chemistry III)—4^2 hours, Professor Nicholson.
Descriptive geometry (Drawing III)—4 hours, Professor Kirchner.
Mathematics (Mathematics II, III)—5 hours, Mr. Groat.
Mineralogy (Geology and Mineralogy, Mineralogy II)—2 hours, Professor Hall and Dr. Berkey.
Surveying (Mining VIII)—3 hours, Mr. McCarty.

SUMMER WORK—MONTH OF AUGUST

Surveying (Mining IX)—4 weeks, Professor van Barneveld and Mr. McCarty.

SOPHOMORE YEAR

FIRST TERM

Chemistry (Chemistry IV)—4^2 hours, Professor Sidener.
Descriptive geometry (Drawing IV)—2^2 hours, Professor Kirchner.
Elementary Mechanics (Physics I)—4 hours, Professor Jones.
Mathematics (Mathematics III, IV)—5 hours, Mr. Groat.
Metallurgy (Metallurgy IV)—3 hours, Professor Appleby.
Topographic drawing (Drawing VII) 2^2 hours, Professor Kirchner.

SECOND TERM

Chemistry (Chemistry V)—4^2 hours, Professor Sidener.
Mathematics (Mathematics IV, V)—5 hours, Mr. Groat.
Metallurgy (Metallurgy V)—3 hours, Professor Appleby.
Mining (Mining I)—2 hours, Professor van Barneveld.
Physics (Physics II)—4 hours, Professor Jones.
Working drawings (Drawing V)—4^2 hours, Professor Kirchner.

THIRD TERM

Chemistry (Chemistry VI)—4^2 hours, Professor Sidener.
Mathematics (Mathematics V)—5 hours, Mr. Groat.
Metallurgy (Metallurgy VI)—3 hours, Professor Appleby.
Mining (Mining I)—2 hours, Professor van Barneveld.
Structural drawing (Drawing VI)—2^2 hours, Professor Kirchner.
Physics (Physics VII)—4 hours, Professor Jones.

SUMMER WORK—MONTH OF MAY

Mining (Mining II) } —4 weeks, { Professor van Barneveld, Professor Appleby,
Metallurgy (Metallurgy XI) } { Mr. Christianson and Mr. McCarty.

JUNIOR YEAR

FIRST TERM

Geology (Geology and Mineralogy, Geology I)—2 hours, Professor Hall.
Mechanics (Mechanics I, II)—5 hours, Mr. Groat.
Metallurgy (Metallurgy VII)—4 hours, Professor Appleby.
Mine surveying (Mining X)—3 hours, Professor van Barneveld.
Mining (Mining III)—4 hours, Professor van Barneveld.
Mine mapping (Mining XI)—3^2 hours, Mr. McCarty.
Petrology (Geology and Mineralogy, Geology III)—2^2 hours, Dr. Berkey.

SECOND TERM

Geology (Geology and Mineralogy, Geology II)—2 hours, Professor Hall.
Mechanics (Mechanics I, II)—5 hours, Mr. Groat.
Metallurgy (Metallurgy VIII)—4 hours, Professor Appleby.
Mining (Mining III)—4 hours, Professor Van Barneveld.
Ore-dressing (Mining VI)—3 hours, Professor Van Barneveld.
Optical mineralogy {Geology and Mineralogy, Mineralogy III.} 2^2 hours, Professor Hall and Dr. Berkey.
Strength of materials (Mechanical Eng. XXVII)—2^2 hours, Professor Smith.
Steam engine (Mechanical Eng. XIX)—3 hours, Professor Flather.

THIRD TERM

Applied geology (Geology and Mineralogy, Geology V)—4 hours, Professor Hall.
Mechanical laboratory (Mechanical Eng. XXVIII)—2^2 hours, Professor Smith.
Petrography (Geology and Mineralogy, Geology VI)—2^2 hours, Professor Hall.
Mechanics (Mechanics III)—5 hours, Mr. Groat.
Metallurgy (Metallurgy IX)—4 hours, Professor Appleby.
Mining (Mining III)—4 hours, Professor van Barneveld.
Ore-dressing (Mining VI)—3 hours, Professor van Barneveld.

FIELD WORK—MONTH OF MAY

Mining (Mining IV)
Metallurgy (Metallurgy XI) }—4 weeks, {Professor van Barneveld, Professor Appleby, Mr. Christianson and Mr. McCarty.

SENIOR YEAR

FIRST TERM

Chemistry (Chemistry XVI)—4^2 hours, Professor Frankforter.
Electric power (Electric Engineering III)—5^2 hours, Professor Springer.
Mining (Mining V)—5 hours, Professor van Barneveld.
Ore testing (Metallurgy II)—3 hours, Professor Appleby.
Ore testing laboratory (Metallurgy II)—4 hours, Professor Appleby and Mr. Christianson.
Thermodynamics (Thermodynamics and Prime Movers I)—3 hours, Mr. Groat.

SECOND TERM

Chemistry (Chemistry XXIII)—4^2 hours, Professor Sidener.
Mining (Mining V)—5 hours, Professor van Barneveld,
Ore Deposits (Geology and Mineralogy, Geology IX)—4 hours, Professor Hall.
Ore testing laboratory (Metallurgy II)—4^2 hours, Professor Appleby and Mr. Christianson.
Ore testing (Metallurgy II)—2 hours, Professor Appleby.
Prime movers (Thermodynamics and Prime Movers II)—3 hours, Mr. Groat.
Thesis—4 hours.

THIRD TERM

Chemistry (Chemistry XXVIII)—4[2] hours, Professor Sidener.
Designs and specifications (Mining VII)—4[2] hours, Professor van Barneveld.
Geology (Geology and Mineralogy, Geology X)—4 hours, Professor Hall.
Mechanical laboratory (Mechanical Engineering XXXII)—4[2] hours, Professor Smith.
Mining (Mining V)—5 hours, Professor van Barneveld.
Thesis—4 hours.

DEPARTMENT OF METALLURGY

ASSAYING

The lectures treat of and describe apparatus, reagents, assay furnaces, fuels, etc., in connection with this subject. The principles of assaying and sampling are fully explained. A collection of representative ores of various metals with a collection of corresponding slags are shown, and instruction is given as to nature and quantity of fluxes. Special and rapid methods of testing slags and metallurgical products as employed in western smelting works are emphasized.

The laboratory courses include preparing and testing reagents, making cupels, etc., and assaying samples of ore, furnace and mill products; different charges are tried and practical conclusions drawn. Assay of bullion for fineness.

Great importance is attached to the work in the laboratory. A large well ventilated furnace room, in which are located muffle and crucible furnaces, and another room of similar dimension equipped with desks, pulp and bead balances, afford accommodations to a large number of students. Ores of various metals of known value are given the students, who are required to make up the necessary charges and submit their reports in detail. This work is offered to students completing the necessary courses in mineralogy and chemistry.

The assay laboratories are located in Pillsbury Hall, and consist of—

1. *Preparation room.* Where the samples and re-agents are weighed. This operation is conducted in a room entirely apart from the furnace room. The separation of the laboratory from the furnace room is of the greatest importance to the student. The preparation of ore is effected by a Forster crusher, Frazer & Chalmers sample pulverizer, and Bridgman ore sampler. The machines are run by an electric motor. Much time is thereby saved to the student for extended or advanced work in special lines.

2. *Furnace room.* After the sample has been placed in suitable vessels for fusion, it is taken to the furnace room, which communicates directly with the preparation room. This room is well equipped with crucible and muffle furnaces and all the appurtenances necessary for carrying on the reduction of the metals from their ores by fire methods.

3. *Balance room.* In this room are various balances for accurately weighing the gold and silver beads, and bullion.

ORE TESTING

The lectures treat of the use and purposes of all the machinery connected with the subject, supplemented with detail drawings.

There are complete testing works connected with the department where the student may see the working of, and handle for himself, crushers, rolls, Huntington mill, concentrating machinery, such as vanners, buddles, jigs, pans for amalgamation, settlers, reverberatory furnaces for oxydizing and oxydizing-chloridizing roasts, leaching and chlorination plants, as well as sizing apparatus and hydraulic separators. Sufficiently large amounts of ore are given to make the necessary tests upon the different machines, and the students report the best method of treatment. Two terms, eleven hours per week in senior year, are devoted to instruction and laboratory work, and are required of students both in mining and metallurgy.

The ore testing works meet educational as well as commercial needs.

Educational. The ore testing plant acquaints the student with the construction and manipulation of the principal typical machines used in the leading ore dressing establishments of the country. It is here that students in mining and metallurgical engineering get the requisite practical experience. They handle all machines and operate on sufficiently large amounts of material to determine the method best suited to a given ore to extract the largest amount of metal, with the least possible loss.

Commercial. Ore testing works are an important factor in mining and metallurgical projects. The commercial object is to determine the best method of treating a given ore so as to yield the largest percentage of the metal it contains at the least possible cost. Samples varying from 500 pounds to car load lots can be treated by various methods.

The ore testing works are located on the east bank of the Mississippi, between the Great Northern and Northern Pacific railroads. Located at this point on the University campus, it offers the very best of facilities for both educational and commercial purposes.

As the funds appropriated for the erection of such a plant were sufficient to purchase only the necessary machinery, the business men of Minneapolis generously provided a suitable building. This building, 94x66 feet, is built of brick and stone.

Machinery. The plant contains all the machinery necessary to illustrate the various processes of ore testing, viz: a Bridgman mechanical sampler, size B; a link belt bucket elevator; a pulley feeder complete; a pair of 12½x12 geared rolls complete; a four compartment spitzkasten; a three compartment Hartz jig; a Collum jig complete with cone for driving; a three and a-half foot Huntington mill complete; a three stamp mill, 275-pound stamps; a five stamp mill, 850 pound stamps; a Challenge automatic feeder for five-stamp battery; a suspended Challenge feeder for three-stamp battery; a Tulloch feeder for Huntington mill; a single deck buddle, twelve feet in diameter; a four-foot plain belt Frue vanner; a Cammett concentrator; a three-foot amalgamating pan; a five-foot settler; a Bruckner roasting furnace, with fire box on wheels; a chlorination barrel; a battery tightener; a two-horse power vertical boiler; a steam drying pan; three trommels, with driving arrangement and gears; a one thousand pound Reedy elevator.

complete with worm gear, two overhead crawls, each with eighty foot track; one-ton pulley block; a quarter-ton pulley block, a scoop car, with flat wheels; two twenty horse power electric motors; three MacDermott automatic samplers, etc.

METALLURGY

This subject is well illustrated with representative ores of all the most important metals, drawings of furnaces, models and samples of all the different furnace products. The lectures treat all the principal methods now in use.

The practical work consists in visits to smelting and refining works which are accessible. The work in metallurgy extends through three years.

COURSES IN METALLURGY

FRESHMAN YEAR

FIRST TERM

Chemistry (Chemistry I)—4^2 hours, Professor Nicholson.
Drawing (Drawing I—4^2 hours, Professor Kirchner.
Mathematics (Mathematics I)—5 hours, Mr. Groat.
Mineralogy (Geology and Mineralogy, Mineralogy I)—4^2 hours, Professor Hall and Dr. Berkey.

SECOND TERM

Assaying (Metallurgy I)—2 hours, Professor Appleby.
Assaying (Metallurgy I) 2^2 hours, Professor Appleby and Mr. Christianson.
Chemistry (Chemistry II)—4^2 hours, Professor Nicholson.
Constructive geometry (Drawing II)—5^2 hours, Professor Kirchner.
Mathematics (Mathematics I and II)—5 hours, Mr. Groat,
Mineralogy (Geology and Mineralogy, Mineralogy II)—4^2 hours, Professor Hall and Dr. Berkey.

THIRD TERM

Assaying (Metallurgy I)—2 hours, Professor Appleby.
Assaying laboratory (Metallurgy I)—4^2 hours, Professor Appleby and Mr. Christianson.
Chemistry (Chemistry III)—4^2 hours, Professor Nicholson.
Descriptive geometry (Drawing III)—4 hours, Professor Kirchner.
Mathematics (Mathematics II and III)—5 hours, Mr. Groat.
Mineralogy (Geology and Mineralogy, Mineralogy II)—2 hours, Professor Hall and Dr. Berkey.
Surveying (Mining VIII) 3 hours, Mr. McCarty.

SUMMER WORK—MONTH OF AUGUST.

Surveying (Mining IX)—4 weeks, Professor van Barneveld and Mr. McCarty.

SOPHOMORE YEAR

FIRST TERM

Chemistry (Chemistry IV)—4^2 hours, Professor Sidener.
Descriptive geometry (Drawing IV)—2^2 hours, Professor Kirchner.
Elementary mechanics (Physics I)—4 hours, Professor Jones.
Mathematics (Mathematics III and IV)—5 hours, Mr Groat.
Metallurgy (Metallurgy IV)—3 hours, Professor Appleby.
Topographic drawing (Drawing VII)—2^2 hours, Professor Kirchner.

SECOND TERM

Chemistry (Chemistry V)—4^2 hours, Professor Sidener.
Mathematics (Mathematics IV and V)—5 hours, Mr. Groat.
Metallurgy (Metallurgy V)—3 hours, Professor Appleby.
Mining (Mining I)—2 hours, Professor van Barneveld.
Physics (Physics II)—4 hours, Professor Jones.
Working drawing (Drawing V)—4^2 hours, Professor Kirchner.

THIRD TERM

Chemistry (Chemistry VI)—4^2 hours, Professor Sidener.
Structural drawing (Drawing VI)—2^2 hours, Professor Kirchner.
Mathematics (Mathematics V)—5 hours, Mr. Groat.
Metallurgy (Metallurgy VI)—3 hours, Professor Appleby.
Mining (Mining I)—2 hours, Professor van Barneveld.
Physics (Physics VII)—4 hours, Professor Jones.

FIELD WORK—MONTH OF MAY

Mining (Mining II
Metallurgy (Metallurgy XI) } 4 weeks, { Professor van Barneveld, Professor Appleby, Mr. Christianson and Mr. McCarty.

JUNIOR YEAR

FIRST YEAR

Geology (Geology and Mineralogy, Geology I)—2 hours, Professor Hall.
Mechanics (Mechanics I and II)—5 hours, Mr. Groat.
Metallurgy (Metallurgy VII)—4 hours, Professor Appleby.
Mine mapping (Mining XI)—3^2 hours, Mr. McCarty.
Mine surveying (Mining X)—3 hours, Professor van Barneveld.
Mining (Mining III)—4 hours, Professor van Barneveld.
Petrology (Geology and Mineralogy, Geology III)—2^2 hours, Dr. Berkey

SECOND TERM

Geology (Geology and Mineralogy, Geology II)—2 hours, Professor Hall.
Optical mineralogy { Geology and Mineralogy, Mineralogy III, } 2^2 hours, Professor Hall and Dr. Berkey.
Steam engines (Mechanical Engineering XIX)—3 hours, Professor Flather.
Strength of materials (Mechanical Engineering XXVII)—2^2 hours, Professor Smith.
Mechanics (Mechanics I and II)—5 hours, Mr. Groat.
Metallurgy (Metallurgy VIII)—4 hours, Professor Appleby.
Mining (Mining III)—4 hours, Professor van Barneveld.
Ore dressing (Mining VI)—3 hours, Professor van Barneveld.

THIRD TERM

Applied geology (Geology and Mineralogy, Geology V)—4 hours, Professor Hall.
Mechanical laboratory (Mechanical Engineering XXVIII)—2^2 Professor Smith.
Mechanics (Mechanics III)—5 hours, Mr. Groat.
Metallurgy (Metallurgy IX)—4 hours, Professor Appleby.
Mining (Mining III)—4 hours, Professor van Barneveld.
Ore dressing (Mining VI)—3 hours, Professor van Barneveld.
Petrography (Geology and Mineralogy, Geology VI)—2^2 hours, Professor Hall.

SUMMER WORK—MONTH OF MAY

Mining (Mining IV)
Metallurgy (Metallurgy XI) } 4 weeks, { Professor van Barneveld, Professor Appleby, Mr. Christianson and Mr. McCarty.

SENIOR YEAR

FIRST TERM

Chemistry (Chemistry XVI)—4^2 hours, Professor Frankforter.
Electric power (Electrical Engineering III)—5^2 hours, Professor Springer.

Mining (Mining V)—5 hours, Professor van Barneveld.
Ore testing (Metallurgy II)—3 hours, Professor Appleby.
Ore testing laboratory (Metallurgy II)—4 hours, Professor Appleby and Mr. Christianson.
Thermodynamics (Thermodynamics and Prime Movers I)—3 hours, Mr. Groat.

SECOND TERM

Chemistry (Chemistry XXIII)—4^2 hours, Professor Sidener.
Electro-chemistry (Chemistry XIX)—4 hours, Professor Frankforter.
Mining (Mining V)—5 hours, Professor van Barneveld.
Ore testing (Metallurgy II)—2 hours, Professor Appleby.
Ore testing laboratory (Metallurgy II)—4^2 hours, Professor Appleby and Mr. Christianson.
Prime movers (Thermodynamics and Prime Movers II)—3 hours, Mr. Groat.
Thesis—4 hours.

THIRD TERM

Chemistry (Chemistry XXVIII)—4^2 hours, Professor Sidener.
Designs and specifications (Metallurgy XII)—4^2 hours. Professor Appleby and Mr. Christianson.
Electro-metallurgy (Metallurgy X)—4 hours, Mr. Christianson.
Mechanical laboratory (Mechanical Engineering XXXII)—4^2 hours, Professor Smith.
Mining (Mining V)—5 hours, Professor van Barneveld.
Thesis—4 hours.

COURSES OF INSTRUCTION

COURSES IN CHEMISTRY

Course I. Qualitative analysis. *Freshman i*, 96 hours

Lectures and laboratory work. The course includes the reactions of the metals as applied to their separation and identification. 3 hours lectures, 5 hours laboratory.

Course II. Qualitative analysis. *Freshman ii*, 96 hours

Lectures and laboratory work. A study of the reactions of the acids as applied to their separation and identification. Open to those who completed course i.

Course III. Qualitative analysis. *Freshman iii*, 96 hours

Lectures and laboratory work. The work in this course will include an examination of alloys, minerals, slags and other compounds. Open to those who have completed course ii.

Course IV. Quantitative analysis. *Sophomore i*, 96 hours

Lectures and laboratory work. The course includes an introduction to quantitative and a beginning of gravimetric analysis. Open to those who have completed course iii.

Course V. Quantitative analysis. *Sophomore ii*, 96 hours

Lectures and laboratory work. A continuation of course iv.

Course VI. Volumetric analysis. *Sophomore iii*. 96 hours

Lectures and laboratory work. The course includes an introduction to volumetric determinations with a discussion of standard solutions and the necessary stœchiometric calculations. Open to those who have completed course v.

Course XVI. Special problems. *Senior i*, 48 hours or more

Laboratory work. The course includes the working out of various mineralogical, technological and metallurgical problems. Open to those who have completed course vi.

Course XIX. Electro-chemical analysis. *Senior ii*, 48 hours or more

Lectures and laboratory work. The course includes the qualitative and quantitative separation of metals by electrolysis, Open to those who have completed course vi.

Course XXIII. Iron and steel analysis *Senior ii,* 48 hours or more

Lectures and laboratory work. The course includes the rapid determination of iron by the various methods, as well as the determination of associated elements, sulphur, phosphorus, silicon, manganese, carbon and others. Open to those who have completed course vii.

Course XXVIII. Special problems. *Senior iii,* 48 hours or more

Laboratory work. This course includes work on ores of base metals, limestone, slags, etc.

COURSES IN DRAWING

Course I. Freehand. *Freshman i,* 96 hours

Lettering, geometric forms and engineering details in outline, including working sketches, translations and the elements of perspective.

Course II. Mechanical *Freshman ii,* 96 hours

Conventional methods, machine and structural details and standard sizes and shapes.

Course III. Descriptive geometry, *Freshman iii,* 48 hours

Problems relating to points, lines, planes, solids, interpenetrations, surfaces of revolution, tangents and developments, including the constructive geometry involved. Recitations and lectures.

Course IV. Descriptive geometry. *Sophomore i,* 96 and 48 hours

Orthographic, isometric, horizontal, topographic, oblique, and perspective projections; shades and shadows, line shading and brush tinting. Open to students who have completed course iii.

Course V. Working drawings *Sophomore ii,* 96 hours

Engineering details, assembly drawings, mechanical movements, tracing and blue printing.

Course VI. Structural drawing. *Sophomore iii,* 32 hours

Detail and construction drawings of mining machinery, head frames, cars, skips and other mining appliances.

Course VII. Topographic drawing. *Sophomore i,* 48 hours

Plans, sections, timbering, and mine conventions. Topographic maps.

COURSE IN ELECTRICAL ENGINEERING

Course III. Electric power. *Senior i.*

Elements of theory and practice of electrical measurements, wiring, dynamos, motors and electric lighting. 33 lectures and 44 hours laboratory.

COURSES IN GEOLOGY AND MINERALOGY

MINERALOGY

Course I. General mineralogy. *Freshman i, ii.*

The physical and chemical characters of minerals; a study of the native elements and the ores of the common metals; the occurrence and association of economic minerals.

Descriptive mineralogy and classification; rock-forming minerals; genetic relationships and distribution.

Laboratory work consists of tests illustrating the range of minerals and the application of chemical and blowpipe analyses to the determination of species; an introduction to the methods of quantitative blowpipe analyses; special topics; reference reading and discussions. Eight hours a week.

Course II. Physical mineralogy. *Freshman iii.*

An introducton to crystallography; physical characters of greatest service in rapid determination. Hand specimen practice preparatory to rock study. Lectures and field work. Two hours a week.

Course III. Optical mineralogy. *Junior ii.*

A study of the structure of crystals and crystal grains. An application of the methods of determination by optical properties; the use of the petrographers' microscope, embracing the elements of lithology. Lectures and laboratory work. Four hours a week.

GEOLOGY

Course I. Physical geology. *Junior i.*

1, Geodynamics, discussing the atmosphere, water, terrestrial heat, plants and animals, as geological agents. 2, structural geology, explaining stratification, displacements, dislocations, fractures, induced rock-structures and mineral veins in their relation to the arrangement of materials in the earth. 3, physiographic geology pointing out the more prominent earth features and discussing their origin, significance and the agencies affecting them. Field excursions are required. Scott's Introduction. Two hours a week.

Course II. Historical geology. *Junior ii.*

A study of the strata of the earth. An outline of the salient features of the earth's history, discussing its several eras with their faunas and floras. The special purpose of the course is to outline the geographical history of the North American continent. Scott's Introduction, lectures and reading. Two hours a week.

Course III. Petrographical geology. *Junior i.*

General considerations of the origin and occurrence of rocks, i. e., Petrogenesis. The structure and texture of rocks. Preliminary studies of the mineral, physical and chemical constitution of the crystalline rocks with a view to their general description. Kemp's Handbook of Rocks. Reference reading and demonstrations. Four hours a week.

Course V. Applied geology. *Junior iii.*

An outline of the economic relations of geology. The course comprises a discussion of the nature and distribution of non-metallic rocks and minerals of an economic value, including coal, mineral oils and natural gas, phosphates and other natural fertilizers, together with soils; the geologic conditions of water supply; abrasives and fictile materials; natural and artificial building stones; mortars and cements for construction and road-making, followed by a brief summary of the nature and distribution of ore deposits of the less and more important metals. Williams' Applied Geology and reference reading. Four hours a week.

Course VI. Petrography. *Junior iii.*

An investigation of the megascopic and microscopic characters of crystalline rocks; a discussion of their crystalline habit, mineral composition and genetic relations. The course extends into an examination of some Minnesota groups of crystalline rocks. Practically a continuance of course iii of mineralogy. Laboratory, with lectures and reference reading. Four hours a week.

Course IX. Ore deposits. *Senior ii.*

History of mineral discovery and development in the Americas; a discussion of the origin and distribution of ore deposits, embracing the chemical processes involved in their formation and subsequent alterations. A description of the geology and mineralogy of ore bodies, particularly those yielding gold, silver, copper, iron, lead and zinc. Kemp's Ore Deposits. Four times a week.

Course X. Special problems. *Senior iii.*

The investigation by individual students of particular problems, involving the field work of an investigation of some particular formation and the laboratory investigation and reading incident to the study of the material collected. The methods of systematically recording and interpreting geological and mineralogical data as observed in the field; the keeping of notebooks, preparation of geological maps, profiles and sections will be taught. Four times a week.

COURSES IN MATHEMATICS

Course I. Algebra. *Freshman i, ii.*

Factors of general quadratic, of $(x^n - y^n)$, of $(ax^n + bx^{n-1} + \ldots . A)$, of $(a^3 + b^3 + c^3 - 3abc)$, cyclic order, simple and quadratic equations, change in value of algebraic expressions, limits, meaning of f(x), there are n nth roots of a number, simultaneous equations and elimination, surds and imaginaries, progression, systems of enumeration, permutations and combinations, binomial theorem, series, convergence and divergence, exponential theorem, logarithms, theory of equations. Subject continues first term and first three weeks second term. Five hours per week.

Course II. Trigonometry. *Freshman ii, iii.*

Plane, analytic and spherical. Last eight weeks, second term and first two weeks third term. Five hours a week. Preparation, course i.

Course III. Analytic geometry. *Freshman iii, sophomore i.*

Construction of loci from their equations, change in value of functions, straight line, conic sections, hyperbolic functions, tangents and normals, limit of a certain ratio, an analytic expression for the slope of a tangent, slope by the method of equal roots, area of a curve the limit of a certain sum, functions represented either by an ordinate or area, transcendental and higher plane curves, a short course in analytic geometry of three dimensions. Last nine weeks third term and first part first term. Five hours per week. Preparation, course ii.

Course IV. Differential calculus. *Sophomore i, ii.*

Relation of the infinitesimal analysis to algebra, symbolism, derivative the limit of a ratio, differentiation an algebraic operation, increasing and decreasing functions, elementary forms including the hyperbolic functions, successive differentiation, expansion of functions, indeterminate forms, variation of functions, rates and differentials, two and more variables, partial differentiation, maxima and minima, change of variable, applications to analytic geometry. Last half first term and first half second term. Five hours per week. Preparation, course iii,

Course V. Integral calculus. *Sophomore ii, iii.*

Definite integral the limit of a sum, integration considered the inverse of differentiation, elementary forms including the hyperbolic functions, geometrical applications, rational fractions, rationalization, formulæ of reduction, double and multiple integration, ordinary differential equations, problems involving the use of various systems of co-ordinates. Last half second term and first half third term. Five hours per week. Preparation, course iv.

COURSES IN MECHANICS

Course I. Statics and dynamics. *Junior i, ii.*

Mathematical investigation of the equilibrium and motion of rigid bodies. Recitations and lectures. Numerous problems in work, power, energy and friction. First part first term and last part second term, 5 hours per week. Preparation, mathematics v and physics i.

Course II. Mechanics of materials. *Junior i, ii*

Mathematical investigation of the strength snd elasticity of materials, in which are established the theoretical principles of design for beams, shafts, boiler plates, riveting and other structural members. Last part first term and first part second term, 5 hours per week. Preparation course i.

Course III. Hydromechanics. *Junior iii.*

Equilibrium and flow of fluids. Hydraulic problems. Preparation, course ii.

COURSES IN MECHANICAL ENGINEERING

Course XIX. Steam engine. *Junior ii*, 36 hours.

Mechanics of the steam engine. Work in the cylinder; effect of reciprocating parts; steam distribution. Mechanism of steam engines. A study of the details of modern steam engines. Valves and valve gears. A study of the slide valve, link motions and other reversing gear; automatic cut-off gears and the Zeuner diagram. The steam engine indicator. Principles and operation of the instruments, indicator rigging; indicator cards; compounding. Preparation, course i in applied mechanics. Three hours a week.

Course II. Hydraulic motors. *Senior ii.*
Theory of water turbines, preceded and followed by some connected hydraulic problems. Preparation, mechanics iii.

Course XXVII. Strength of materials. *Junior ii*, 48 hours.
Laboratory work investigating the strength and physical qualities of iron, steel, brass, copper, belting, chains, beams, brick and stone. Preparation, course i applied mechanics. Four hours a week.

Course XXVIII. Mechanical laboratory. *Junior iii*, 48 hours.
Continuation of course xxvii; also exercises in valve setting, indicator practice, calibration of steam gauges, efficiency of screws and hoists. Preparation, course xix. Four hours a week.

Course XXXII. Mechanical laboratory. *Senior iii*, 72 hours.
Calibration of weirs, meters and other hydraulic apparatus; calorimetry; tests of pumps, engines and boilers. Open to students who are taking or have completed courses i and ii, thermodynamics. Eight hours a week.

COURSES IN METALLURGY.

Course I. Assaying. *Freshman ii and iii.*
Determination of values of the ores. Lectures, recitations and laboratory work. Open to those who take courses i, ii, iii, chemistry, and have completed courses i, ii, mineralogy.

Course II. Ore testing. *Senior i and ii.*
Determination of methods of ore treatment. Lectures and practical work. Open to those who have completed course i.

Course III. Mill work. *Junior iii.*
Practical experience in handling ore dressing machinery. Open to those completing course ii.

Course IV. General metallurgy. *Sophomore i.*
Including the subjects of combustion, fuels, refractory materials and furnaces. Open to those who have completed course i.

Course V. Metallurgy of iron. *Sophomore ii.*
Lectures and recitations. Open to those who have completed course v.

Course VI. Metallurgy of wrought iron and steel. *Sophomore iii.*
Lectures and recitations. Open to those who have completed course v.

Course VII. Metallurgy of the precious metals. *Junior i.*
Gold, silver and platinum. Lectures and recitations. Open to those who have completed course v.

Course VIII. Metallurgy of the base metals. *Junior ii.*
Associated with precious metals, including lead, copper, etc. Lectures and recitations. Open to those who have completed course vii.

Course IX. Metallurgy of other base metals *Junior iii.*
Comprising aluminum, zinc, tin, mercury. Lectures and recitations. Open to those who have completed course vii.

Course X. Electro-metallurgy. *Senior iii.*
Lectures and recitations. Open to those who have completed course viii.

Course XI. Field work in metallurgy.
Conference and reports. Last four weeks *sophomore iii and junior iii.* Open to those who have completed course vi.

Course XII. Designs and specifications. *Senior iii.*
Supplementing thesis.

COURSES IN MINING

Course I. Explosives, blasting, air compressors, etc. *Sophomore ii, iii.*
Two hours a week, each term.

Course II. Field work. *Sophomore iii.*
Work in mines. Open to those who have completed course i. Last four weeks of the term.

Course III. Mining. *Junior i. ii, iii.*
Mode of occurrence of ore bodies; prospecting, shaft-sinking, tunneling, drifting, stoping, timbering. Open to those who have completed courses i, ii. *Junior i, ii.* Four hours a week.
Methods of metal mining. Methods of coal mining. Hydraulic mining. *Junior iii.* Four hours a week.

Course IV. Field work. *Junior iii.*
Practice in mine surveying and field geology, study in mines. Open to those who have completed courses i, ii, iii, x. Last four weeks of the term.

Course V. Mining. *Senior i, ii, iii.*
Mining machinery, underground transportation, hoisting, pumping, ventilation. Electricity applied to mining. The examination of a mining property. Sampling ore reserves, etc. Mine accounts. Mine accidents, Open to to those who have completed courses iii, iv. Five hours a week.

Course VI. Ore dressing. *Junior ii, iii.*
Mechanical preparation of ore for market, for metallurgical treatment, etc. Three hours a week.

Course VII. Designs and specifications. *Senior iii.*
Designs of mine cars, skips, head frames, etc., in connection with thesis work. Open to those who have completed senior i and ii. Eight hours a week.

Course VIII. Plane surveying. *Freshman iii.*
Computation, platting, with special reference to mine surveying. Three times a week.

Course IX. Field work. *Freshman.*
Practice in plane surveying during the month of August, with special reference to mine surveying. Open to those who have completed course viii.

Course X. Mine surveying. *Junior i.*
Computations, methods, etc. Open to those who have completed courses viii and ix. Three times a week.

Course XI. Mine mapping. Six hours a week. *Junior i.*

COURSES IN PHYSICS

Course I. Mechanics *Sophomore i.*
Dynamics of solids, with laboratory practice. Freshman mathematics required.

Course II. Hydraulics and heat. *Sophomore ii.*
With experimental lectures and laboratory practice. Course I required.

Course VII· Electricity and magnetism. *Sophomore iii.*
With experimental lectures. Course II required.

COURSES IN THERMODYNAMICS AND PRIME MOVERS

Course I. Thermodynamics. *Senior i.*
Lectures and recitations on the mechanical theory of heat, during which are investigated the properties of steam, with special application to the steam engine. Considerable time is also devoted to gas, air and other heat engines. Preparation, mechanics iii.

THE
COLLEGE OF AGRICULTURE
THE
SCHOOL OF AGRICULTURE
THE
DAIRY SCHOOL
AND THE
EXPERIMENT STATION

The College of Agriculture.

THE FACULTY.

Cyrus Northrop, LL. D., *President.*
William M. Liggett, *Dean.*
Samuel B. Green, B. S., *Professor of Horticulture and Forestry.*
* Otto Lugger, Ph. D., *Professor of Entomology.*
Harry Snyder. B. S., *Professor of Agricultural Chemistry.*
T. L. Haecker, *Professor of Dairy Husbandry.*
M. H. Reynolds, M. D., V. M., *Professor of Veterinary Medicine and Surgery.*
Willet M. Hays, M. Agr., *Professor of Agriculture.*
Thomas Shaw, *Professor of Animal Industry.*
Virginia C. Meredith, *Professor of Home Economics.*

Note—The instructien not given by the faculty of the college of agriculture is given by the faculties of the college of science, literature and the arts, the department of law, and the department of medicine.

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* Deceased.

PURPOSE AND SCOPE.

The college course emphasizes the sciences of botany, chemistry geology, physics and zoology, the importance of plant and animal production and the upbuilding of rural homes and farm life. In the first two years following after the four years of excellent preparation received by the students in the school of agriculture, little opportunity for electives is given, and twelve terms of scientific work in botany, chemistry, physics and zoology are required during the freshman and sophomore years. The student may elect a six-term course in either botany or zoology, or a three-term course in each. In chemistry and physics the student elects a four-term course in one and a two-term course in the other. In the last two years the course for men is all elective, while for women additional subjects in literature and the arts are required. German, French and Scandinavian are deemed of greater value in this course than the classics, and the latter are not included among the electives. The technical subjects in agriculture and household economies are offered in the junior and senior years, when the freedom for election enables the student to choose as a specialty a major science, an agricultural or a household subject around which to group related elective subjects. The elective courses during the last two years give opportunity for liberal culture in art, literature and philosophy and for becoming proficient in scientific research work in some of the many problems pressing for solution in the development of the state and national agricultural experiment stations. This course is designed to give a broad preparation for farm life or for the work of the specialist in the sciences and arts relating to rural industries and rural life.

REQUIREMENTS FOR ADMISSION.

Candidates for admission to the freshman class are required to show attainment equal to that represented by the certificate of graduation from the school of agriculture. Graduates of the school of agriculture who have completed the studies required for entrance to this college are admitted on the presentation of their certificates. After 1901 all graduates of the school of agriculture before admission to this college are also required to present with their certificates testimonials showing that the have completed the fourth year's work as required in the school of agriculture. Graduates from state high schools may be admitted to the freshman class after spending a year in the school of agriculture pursuing such studies as the faculty may require. Before graduation, however, all of the required work in the school of agricultural must be completed.

REQUIREMENTS FOR GRADUATION.

After the completion of the prescribed course of study, including all of the required work and the requisite amount of elective work, students will be recommended for graduation with the degree of Bachelor of Agriculture.

COURSE OF STUDY.

FRESHMAN YEAR.

FIRST TERM.	SECOND TERM.	THIRD TERM.
Botany or Zoology, 4.	Botany or Zoology, 4.	Chemistry, 4.
German, 4	German, 4.	Botany or Zoology, 4.
Drawing, 4.	Drawing; 4.	German, 4.
Solid Geometry, 4.	Trigonometry, 4.	Rhetoric, 4,
1, Military Drill, 2.	1, Military Drill, 2.	1, Military Drill, 2.
2, Physical Culture, 2.	2, Physical Culture, 2.	2, Physical Culture, 2.

SOPHOMORE YEAR.

FIRST TERM.	SECOND TERM.	THIRD TERM.
Chemistry, 4.	Chemistry, 4.	Chemistry, 4.
German, 4.	German, 4.	German, 4.
Botany, Zoology or Psychology, 4.	Botany, Zoology or Psychology, 4.	Botany, Zoology or Logic, 4
Physics or 2 History. or 2 Rhetoric, 4.	Physics or 2 History. or 2 Rhetoric, 4.	History or Rhetoric, 4.
1, Military Drill, 2.	1, Military Drill, 2.	1,Military Drill, 2.
2, Physical Culture, 2.	2, Physical Culture, 2.	2, Physical Culture, 2.
Rhetorical Work, 1.	Rhetorical Work, 1.	Rhetorical Work, 1.

1 For men. 2 For women.

In the junior and senior years men are required to elect twelve subjects from among those offered below in agriculture, agricultural chemistry, animal husbandry, dairy husbandry, entomology, horticulture and forestry, and veterinary medicine and surgery. They are also required to elect twelve terms' work from the following subjects given in the college of science, literature and the arts: Animal biology; botany; chemistry; physics; mathematics; engineering; English; English literature, geology; mineralogy; political economy; history; astronomy; pedagogy; psychology; history of philosophy; social philosophy; elements of contracts; Commentaries of Blackstone; Scandinavian; French; and German,

All students must advise with the Dean or the committee on college work concerning all electives, The following table gives the term in which each course of the agricultural subjects is given:

JUNIOR AND SENIOR AGRICULTURAL ELECTIVES FOR MEN.

PROFESSOR	Fall.	Winter.	Spring.
Green,		Hort. I, II. III, and IV	Hort. IV; Forestry I, II
Haecker.	*I	II, 1900-1; III, 1901-2 IV	II. 1900-1
Hays	II-1900-1; I-1901-2.		III. 1901-2.
Lugger.		Entomology	
Reynolds	I	II	III
Shaw	I	II, III	
Snyder	IV, 1900-1; III; VI	VI	V, 1900-1; VI; VII

Roman numerals refer to courses outlined on future pages in the several divisions.

When the number of the course is followed by the year, the course is given only in years beginning on the even or odd number as designated. In case of a few courses not listed, special arrangements will be made with the professor in charge.

A modified course is being arranged for women. In the junior year, the following subjects are prescribed.

FIRST TERM.	SECOND TERM.	THIRD TERM.
History, 4.	History, 4.	History, 4.
Eng. Lit., 4.	Eng. Lit., or French, 4.	Eng. Lit., or French, 4.
Lit. Criticism, 4.	Lit. Critisism, 4.	Lit. Criticism, 4.
One Agr. Elective, 4.	One Agr. Elective, 4	ne Agr. Elective, 4.
Physical Culture, 2.	Home Economics, 1.	

In each term of the senior year, four 4-period subjects or their equivalent are required of women; these to be elected from among the courses offered in the college of agriculture the college of science, literature and the arts, and the department of medicine, as outlined below.

FIRST TERM.	SECOND TERM.	THIRD TERM.
Agricultural Chemistry,	Agricultural Chemistry,	Agricultural Chemistry.
Eng. Lit., or French.	Eng. Lit., or French.	Eng. Lit., or French.
Geology, 4.	Geology, 2.	Rhetoric, Lectures History of Philosophy—Principles of Ethics.
Horticulture or Floriculture.	Farm Economics.	Sanitary Science, 2.
Bacteriology 2.	Animal Feeding.	Political Science, Minn. Pol. Institutions.
Philosophy, Æsthetics.	Philosophy, History or Ethics,	Horticulture or Floriculture.
Pedagogy,	Home Economics, 2.	Poultry.
Agriculture III.	Elocution.	
Physical Culture.	Dairy Husbandry.	

Other elective courses in domestic science, and also in domestic arts, will be provided and published in a later bulletin. Women who are sufficiently advanced may study music or art during the senior year; provided that no student may receive more than three credits in music and art together.

COURSES OF INSTRUCTION.

AGRICULTURE.

A portion of the work in agriculture is in the form of lectures. The writing of papers on special subjects is made a feature. Research work is arranged for in many cases, and practice work on the farm and in the laboratory is provided. The aim is to have students get experience in field agriculture, both practical and experimental, and in demonstration instruction. The work is a continuation of the agriculture studies in the school of agriculture, each subject being treated from the more technical standpoint.

Course I. Field crops and seed.

In this course are considered the botany, cultivation, use and place in the rotation of the various cereal, forage, root, fiber, sugar, and miscellaneous crops. Special attention is given to the subjects of permanent, rotation, annual, and shift pastures and soilage; to permanent and rotation meadows; and to the production and preservation of all kinds of dry-cured and ensilaged fodders.

Course II. Crop breeding.

Heredity, variation, extensive selection; field crop nursery management; producing new qualities by crossing and by change of environment; out-crossing versus inbreeding and self-fertilization; originating varieties and improving standard varieties; choice foundation stocks; methods of selecting; crossing followed by selection; increasing newly originated stocks; testing new kinds by comparing them with standard varieties; methods of disseminating new varieties.

Course III. Agricultural engineering.

Selecting farms, deciding upon systems of farming, planning farms, subduing new soils, farm building, fences, roads, tillage, irrigation, implements and machinery.

Cousse IV. Farm economics.

Field management, rotation, weeds, labor, prices, purchases and sales, farm finances, the permanent farm investment, agricultural pedagogics.

AGRICULTURAL CHEMISTRY.

In the freshman and sophmore years either two or four terms of chemistry are required.

Course I. (a) *General agricultural chemistry.* *Freshmen iii.*

Lectures and recitations. Particular attention is given to the study of the elements and compounds which are of the most importance in agriculture. The laws governing the combination of elements by weight and volume are illustrated by means of numerous problems. Chemical nomenclature and the periodic system of classifying the elements are prominent features of the work.

(*b*) A continuation of I (a) *Sophomore i.*

Course II. (*a*) *Agricultural qualitative analysis.* *Sophomore ii.*

This course is arranged to meet the special wants of agricultural students. Six hours per week are given to the laboratory work, and one period to a lecture and recitation. The writing of equations and the study of the principles involved in separation of the various groups and the individual compounds and elements are characteristic features of the work. The qualitative analysis of insoluable substances is emphasized. It is the object of this course to familiarize the student with the processes employed in qualitative analysis so that he may be able to determine the composition of all ordinary substances, particularly of those that are of the most importance in agriculture.

(*b*) A continuation of II (a). *Sophomore iii.*

Course III. Agricultural quantitative analysis. *Junior or senior i.*

An elementary course in quantitative analysis. The principles involved in gravimetric and volumetric analysis are studied. Three periods per week are given to laboratory work and one period to a recitation and lecture. The work includes the gravimetric and volumetric determinations of iron, acidimetry, the gravimetric determination of phosphorous pentoxid, and the volumetric determination of calcium oxid. The object of this course is to prepare the student for special work in agricultural chemistry.

Course IV. The chemistry of foods. *Junior or senior i.*

Lectures. This course treats of the chemistry of human and animal foods. The chemistry of plant growth, the food value of the various organic compounds contained in plants, the influences which soil and climate exert upon plant growth, and the various factors which influence the composition and value of farm crops, are studied. The chemistry of animal nutrition and human foods is also considered. It is the object of this course to familiarize the student with the more recent investigations which have a bearing upon the chemistry of human and animal foods, and to enable him to apply these investigations to the best advantage in the productfon and use of foods. Ample facilities are offered in both the laboratory and library for the study of this subject. (Given only in alternate years. Given in 1900.)

Course V. The chemistry of soils and fertilizers. *Junior or senior iii.*

Lectures. The chemical changes that take place in the soil; the various sources of plant food; the power which crops possess of obtaining food from the soil; nitrification: the laws governing the increase and decrease of the soil nitrogen and the organic compounds of the soil and the part which they take in fertility—are some of the more important topics considered. The influence which various methods of farming have upon the fertility of the soil and the best methods for conserving fertility are studied. The subject of judging, rating and scaling soils forms a part of the work. (Given only in alternate years. Given in 1900.)

Couse VI. The analysis of agricultural products. *Junior or senior i, ii., iii.*

Lectures and laboratory practice. (*a*) The determination of nitrogen in food products, the determination of sugar by volumetric, gravimetric and polariscopic methods, and the determination of starch.

(*b*) The analysis of dairy products, including the proximate analysis of milk, butter and cheese, the determination of volatile fatty acids, iodin absorption number, the chemical and physical properties of fatty bodies and the determination of adulterated dairy products.

(*c*) The proximate analysis of human and animal foods, including fodders, grains and milled products, particular attention being given to the analysis of wheat and flour for commercial purposes.

Course VII. The analysis of soils and fertilizers. *Junior or senior iii.*

Lectures and laboratory practice. The chemical analysis of soils by means of strong and weak solvents. This course embraces a study of the principles involved in soil investigations, including the physical analysis of soils. Special elective work is also offered in this subject.

ANIMAL INDUSTRY.

Course I. Animal breeding.

Under this head lectures are given on the laws which govern breeding. The principles are considered upon which a standard of excellence is based and various standards are compared. Heredity in its various features is discussed, not only with reference to characteristics that are normal, but also with reference to those that are abnormal and acquired. Careful consideration is given to the heredity of diseases. The law of correlation is dwelt upon. Prepotency is discussed especially from the standpoint of practical utility. The good and evil that may result from in-and-in breeding and line breeding are pointed out. Fecundity and the influences which affect it are examined. The relative influence of parents, the influence of a previous impregnation and intra-uterine influences. The many and far-reaching influences of nutrition are dwelt upon and quality in live stock, the coat and influences which affect it, and the outcome of artificial conditions generally are gone over with much care. Early maturity, pedigree and animal form as an index of qualities are defined and their great practical value is shown. The art of selection receives special attention. Cross-breeding, grading, the formation of breeds, and the influences of environment are carefully examined.

Course II. Feeding animals.

The question of feeding is considered from both the scientific and the practical standpoints. The foundation for succeeding lectures is laid by first considering some important principles which govern feeding. Feeding rations and nutritive ratios are next discussed and these are followed by lectures on feeding stuffs and the different methods of preparing foods for feeding. Then follows the feeding and management of cattle treated chiefly from the practical standpoint. Lectures are given on rearing calves during the milk period and store animals from the weaning to the finishing period; on finishing for the block on grass, also in the stall; on the selection and care of both males and females of the best breeds, and on stabling suitable for cattle. Similarly the feeding and management of sheep and swine are considered. Careful attention is given to the discussion of wool and its properties and to sheep for wool production, for mutton production, and for both uses combined.

Course III. Pasturing live stock.

Lectures are given with reference to the production of pasture other than grass suitable for the various classes of domestic animals kept on the farm. The most approved methods of pasturing these are also discussed. In these lectures every opportunity available is embraced of illustration by direct reference to living animals and the examination of the various kinds of food more commonly used in feeding them.

DAIRY HUSBANDRY.

Course I. Dairy stock and dairy farm management.

Lectures, one term, three hours per week. Practice work, one term, one hour per week

This course is given during the fall term of the junior year. The lectures cover the breeding, rearing and management of dairy stock, the points and characteristics essential in animals intended for the dairy, practice work in judging dairy stock, and the management of the dairy farm.

Course II. Dairy feeding.

Lectures. two terms, two hours per week.

This course consists of lectures covering both the scientific and practical questions underlying the principles of feeding. Practice work is given in compounding rations, estimating comparative value of food stuffs and other problems connected with the subject. (Given in years beginning with even numbers.)

Courses III. Farm dairying. Lectures and practice work, one term, two hours per week

In this course the student receives lectures on milk, its care, the various methods of creaming it, care of the cream, and the manufacture of butter and sweet curd cheese. A student taking this course devotes the greater portion of his time to practice work in the " Farm Dairy Room." (Given in years beginning with old numbers. One-half credit).

Course IV Factory course in butter and cheese.

This course is offered in January of each year. The work comprises two lectures a day, one on butter and one on cheese, and practice work two afternoons a week in butter making and two afternoons in cheese making. Any student may take either part of this course and obtain a half credit.

Course V. Dairy laboratory work.

The work in this course will not be offered during the year 1900-1901.

ENTOMOLOGY.

The study of entomology will be of a practical nature and only sufficient work will be given in dissecting and classifying insects to enable the student to recognize them as being useful, injurious or indifferent to agriculture and horticulture. The various artificial remedies and insecticides known to be of benefit will be discussed, as well as natural remedies based upon the life history of the insects. Injurious and beneficial insects found in Minnesota will be considered, with a view of fighting the former and protecting the latter. The relationship existing between insects and man, between insects and insects, and between insects and plants will be studied in detail, Students wishing to make a special study of economic entomology can find work in the laboratory during the summer, providing they show aptitude for such work and already possess the preliminary training.

HOME ECONOMICS.

This course is intended to give breadth, strength and thoroughness to the concept of home, and also an appreciation of its privileges as a career for educated women.

Course I.

Lectures once a week during the second term of the junior year. The evolution of the home; the family as a social and economic institution; the relation of the home to civic life; the home as a place and an opportunity for the right development of the physical and spiritual natures.

Course II.

Lectures once a week during the second term of the senior year; home administration; the organization of a home; generic lines of expenditure; domestic service; and disposition of waste.

HORTICULTURE.

Course I. Fruit growing.

Lectures one term. The study of the geography of fruit growing; outlook for fruit growing; planting, tilling and fertilizing of fruit lands; diseases and insects injurious to fruits; spraying, harvesting and marketing of fruit; varieties of fruits.

Course II. Vegetable growing.

Lectures one term. Geography of vegetable growing; tilling and fertilizing vegetable lands; irrigation and rotation of crops; seed growing and seed testing; vegetables under glass; pollination; diseases and insects injurious to vegetables and their prevention; harvesting and marketing; varieties of vegetables.

Course III. Green houses and their management.

Lectures and laboratory work. Green house instruction and management temperature, soil, watering, benches; propagation by seeds, cuttings, layers and graftage; prevention of diseases and extermination of insects injurious to vegetables; rest and growth periods of plants; plants for green house cultivation,

Course IV. Nursery work.

Lectures and laboratory work. Seedage; layerage; cuttage; graftage; planting; pruning; thining; storage of nursery stock; tillage of nursery lands; insects; diseases injurious to the nurseries and their prevention.

Course V. Plant breeding.

Lectures and laboratory work. The fact and philosophy of variation; crossing of plants; origin of domestic varieties.

FORESTRY.

Course I. Lectures.

The forestry situation in this country and its literature; lumbering in Minnesota; forest influences; forest supplies; forest management; prairie forestry.

Course II. Lectures and field work.

Characteristics of forest and ornamental trees that are hardy in Minnesota; their value for timber and other purposes and methods of propagation.

MATHEMATICS.

Mathematics as pursued in the college of agriculture, aims primarily at mental discipline and only secondarily at application to lines of practical work.

Geometry as a discipline for clear perception, accurate statement and logical inference is required, both plane and solid.

Trigometry is required, both as a mental discipline and for application to practica work in surveying.

VETERINARY MEDICINE AND SURGERY.

The work in this department continues through the three terms in the junior year. Instruction is given by text-book, lectures, collateral reading and by practice work in the hospital. The lectures are illustrated by means of skeletons, manikins, charts and by the living animal. Anatomy of the digestive organs and the higher physiology of digestion are given prominence in this work.

Theory and practice of medicine are carried further than in the school of agriculture course. Infectious diseases of domestic animals are studied with reference to causes, recognition, prevention and methods of control. Certain medicines which the intelligent stockman should understand are studied with reference to uses, doses and methods of administration.

Course I.

This is a continuation of the last term's work in the school of agriculture. It includes an advanced study of the veterinary physiology of digestion, taking up the digestive fluids, nervous mechanism of digestion, absorption and digestion of grains and fodders. It also includes a study of body nutrition, body income and expenditures, sources of heat supply and heat loss, and metabolism.

Course II.

The muscular system, including muscle currents, results of contraction, muscle fatigue and laws of muscular work. The nervous system, including irritability of nerves, electric phenomena of nerves, reflex action, and sympathetic nervous system. This course also includes the physiology of the skin and nitrogen excreting apparatus and a study of the locomotor apparatus, including shoeing, diagnosis and treatment of common forms of lameness.

Veterinary Physiology, by F. Smith, is used as a text-book and guide for this work in courses I. and II., but students are required to do collateral reading.

Course III.

This course includes diagnosis and treatment of common diseases; common medicines in their doses, uses, dangers and methods of administration.

GRADUATE WORK.

I. Applicants for advanced work in the college of agriculture shall be referred to the dean of the department of agriculture and to the committee on college and graduate work which shall examine said applicants and have general charge of graduate courses and work, reporting to the faculty of the college of agriculture.

II. A candidate for a second degree in the agricultnral department must take his majorl subject in one of the divisions of the department of agriculture, but may take one or both of his minors in other departments of the University, as the faculty of the college of agricultural may decide.

III. The degree of Master of Agriculture will be conferred on a bachelor of this or any other reputable agricultural college who, not sooner than one year after graduation, if a resident graduate student at this agricultural college, shall pass an examination in certain prescribed lines of study and present a satisfactory thesis.

IV. All general regulations of the college of science, literature and the arts, governing candidates for the master's degree as to preparation, method of selecting work, amount of work required, degree of proficiency expected, and the time and manner of conducting the examinations, shall apply to candidates for master's degrees in the college of agriculture.

V. The degree of Doctor of Philosophy will be conferred by the college of agriculture on bachelors of this or any other reputable agricultural college within not less than three years after graduation therefrom under conditions similar to those prescribed by the faculty of the college of science, literature and the arts.

The School of Agriculture.

FACULTY.

CYRUS NORTHROP, LL. D., *President.*
WILLIAM M. LIGGETT, *Dean.*
FREDERICK D. TUCKER, M. A., *Principal, Mathematics.*
SAMUEL B. GREEN, B. S., *Horticulture, Forestry.*
*OTTO LUGGER, Ph. D., *Zoology, Entomology.*
CHARLES R. ALDRICH, *Drawing Farm Buildings.*
WILLIAM ROBERTSON, B. S., *Physics, Plant Study.*
J. A. VYE, *Penmanship, Accounts.*
HARRY SNYDER, B. S., *Chemistry.*
T. L. HAECKER, *Dairy Husbandry.*
M. H. REYNOLDS, M. D., V. M., *Physiology, Veterinary Science.*
WILLET M. HAYS, M. Agr., *Agriculture.*
THOMAS SHAW, *Animal Industry.*
J. M. DREW, *Blacksmithing, Poultry.*
ANDREW BOSS, *Dressing and Curing Meats, Farm Machinery.*
WILLIAM BOSS, *Carpentry Power Machinery.*
E. W. MAHOOD, M. A., *Algebra, Civics, and Director of Gymnasium.*
JUNIATA L. SHEPPERD, M. A., *Cooking, Laundering.*
MARGARET BLAIR, *Sewing.*
VIRGINIA C. MEREDITH, *Preceptress, Home Economics.*
CHAS. F. KEYES, A. B., *Registrar, Geography and History.*
SOPHIE M. PENDERGAST, B. L., *English.*
ARTHUR C. KOERNER, *Music.*

When applying for admission or information address Frederick D. Tucker, Principal, St. Anthony Park, Minn.

OPENING.

The school year opens September 30th, 1901, and closes March 21st, 1902. The fall term closes Friday, December 20th, and the winter term begins Wednesday, January 3rd, giving a vacation of eleven days. Owing to the shortness of the school year, it is expected that students will be on hand the first day of the term, that registration may be completed and work be begun promptly. Students registered in the fall term will not be received after the first two days of the winter term, unless they present a reasonable excuse for such delay.

HOW TO GET TO THE SCHOOL.

Check your baggage to Minneapolis.

Monday and Tuesday, September 30th and October 1st, members of the Y. M. C. A., wearing lettered badges will be at the Union Station in St. Paul, and at the Union, Milwaukee and St. Louis Stations in Minneapolis, to meet and direct new students.

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*Deceased.

Take the Como Interurban car from either St. Paul or Minneapolis and get off at Dooley Avenue.

The school will transport trunks from Minneapolis for 25 cents each. No charge will be made for the return of the baggage at the close of school provided it is ready to go on the regular days assigned.

ADMISSION.

Applicants will be admitted without examination if they present certificates showing that they have completed a common school course in English grammar, arithmetic, history of the United States, and geography, as prescribed by the state department of public instruction.

State High School board certificates are accepted for work in English, physiology, algebra, geometry and civics.

Applicants who cannot complete the common branches at their home district may be admitted to a preparatory class if they can pass examinations in reading, letter-writing and arithmetic through fractions, or bring third grade certificates from their county superintendents. **But all students who can complete the common branches in their home schools will not be admitted.**

Applicants for admission after the opening of the term will, in addition to the regular entrance examinations,be required to show proficiency in the work done by the class up to the time of their application. All who cannot enter by the first of November should wait until the beginning of the winter term.

EXPENSES.

The cost to the student for board, heat, light and washing is the actual cost for maintaining the table and caring for the house. This does not exceed $3 per week. An assessment of $12 is made in advance for the purchase of provisions at cash prices. At the end of each month the exact cost of board is calculated and an assessment made. At the final settlement the $12 assessed the student when he first entered the school is credited to his board account. The culinary department is managed by an experienced matron and all the buildings are under the supervision of the dean. The buildings are all lighted with electric lights and warmed by steam. The sleeping-rooms are each furnished with a bedstead, mattress, dressing bureau, chair and table.

No deductions in charges are made for absence of less than four days. If students are compelled to be absent for that length of time they will be allowed half rates, *if they arrange with the matron before leaving.*

Text-books are furnished at a term rental of $1 to students who do not desire to purchase.

FEES.—Each student pays an incidental fee of $1.50 per term, and also pays for breakages of apparatus used in practical work.

A competent nurse is kept on the ground to care for the sick. To meet this expense each student is charged a fee of 50c per term.

DEPOSIT.—In addition to the assessment of $12 for board, a deposit of $5 is required of each student as a guaranty for the return of all books and other articles borrowed.

MONEY REQUIRED.—On entering school the student must make a payment of $20; $12 on board, $5 deposit, $1 book rent, $1.50 fee and hospital fee 50c. If books are purchased on entering no rental is charged.

The total expense for the year need not exceed $85 to each student.

MILITARY DRILL UNIFORM.—All male students are required to provide themselves with the prescribed uniform, which consists of navy blue blouse, trousers and cap, and is as neat and economical a dress as the student can obtain. The suit complete, to measure, will be furnished under special contract for $10.75.

Each student furnishes four sheets, one pair of blankets, one quilt, one bed spread, one pillow, three pillow cases, towels, comb and brush.

An assignment of rooms will be made at 9 a. m. commencement day and will hold good only until and including the second day of the following term, when the student's presence will be necessary to make good his claim.

Students wishing to retain their rooms after vacation must be on hand when the second term opens, or pay one-half the price of board and room for the time they are late.

Students arriving after the dormitories are filled, will be compelled to find rooms elsewhere at an additional cost of 50c per week.

REQUIREMENTS FOR GRADUATION.

First—The completion of the prescribed course of study with an honorable standing in deportment.

Second—An essay of not less than one thousand words upon a topic connected with agriculture or home economics.

Third—For young men, a practical experience in field work at the University farm or elsewhere, as shall appear in reports received from responsible sources.

REQUIREMENTS FOR ENTERING THE COLLEGE OF AGRICULTURE.

The following year's work is offered and required of students desiring to enter the college of agriculture:

FIRST TERM	SECOND TERM
*Algebra, [5]	Algebra, [5]
*Geometry, [5]	Geometry, [5]
English, [5]	English, [5]
Elective or †Physics, [5]	Civics, [5]

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*Recitations in geometry begin in Book III., Wells, and in algebra at highest common divisor.

†For women only.

The first building erected upon the campus has been remodeled and furnished for a home for the young men. It contains on the first floor the library; a large reading room supplied with good reading and parlor games; also a parlor in which students receive visits from friends. In the basement are rooms specially adapted for change from recitation rooms into dining rooms for class parties, which enables students to learn the art of receiving and entertaining company.

The building for young women contains a large sitting room for general use; a parlor for more special use; rooms for the preceptress; and thirty suites of rooms for sixty students, each suite consisting of a study room for two with two alcove sleeping rooms adjoining.

This gives each student a separate sleeping room, a study room for herself and one room-mate, the free use of sitting room and parlor in the girls' home, and the benefit of class parties in the home building.

In the large sitting room there are papers, magazines, books and a piano, which affords pleasant recreation.

STUDENTS' DEBATING SOCIETIES.

Societies for the purpose of improvement in elocution and debate and for obtaining instruction in the form of lectures give excellent opportunities for entertainment and culture.

LECTURE COURSE.

During the school year a lecture and entertainment course consisting of six lectures and concerts is given in the chapel at a cost of 50 cents for the series. The best talent is secured and the course is both instructive and elevating. The past year the following was given:

"Sunshine in Labor," Oct. 8, Rev. Thomas McClary.
"Amusement in Literature," Nov. 15, President Cyrus Northrop.
Music and Reading, Dec. 13, Masonic Quartette assisted by Miss Whitridge.
"One-sided People," Jan. 17, Rev. J. S. Montgomery.
"Abraham Lincoln," Feb. 12, Rev. Chas. Bayard Mitchell.
Music and Reading," Mch. 14, Masonic Quartette assisted by Miss Liggett.

STUDENTS' CHRISTIAN ASSOCIATION.

The society has for its objects the study of moral and religious subjects and the holding of regular weekly prayer meetings and conference meetings. All students, regardless of creed, are welcome to membership; no sectarian differences are allowed to be discussed at the meetings or in the reading rooms.

ATHLETIC ASSOCIATION.

The students have a well-organized athletic association and a well-equipped gymnasium. A competent instructor is in charge each evening. An opportunity is thus given for a healthful amusement and for needed physical exercise.

LIBRARY.

The library contains five thousand books of reference, besides five thousand pamphlets, including reports, bulletins, etc.

The library is supplied with a card catalogue from the United States Department of Agriculture of all reports and bulletins issued by the different experiment stations. This enables one to find some reference on nearly every agricultural subject. In connection with the library is the reading room where all the leading agricultural papers, as well as other leading periodicals, are kept on file for the use of students.

COURSE OF STUDY.

FIRST YEAR.

FIRST TERM.

Plant Study [5]

*Drawing [2]
*Music and Gymnasium Work [1]
English [5]

*Blacksmithing [1] *Carpentry [2] Carpentry Lecture [1] *Military Drill [1] Agriculture [3]	or	*Laundering [1] *Physical Culture [1] *Sewing [3] Social Culture [1] Field Agriculture [3]

SECOND TERM.

Plant Study [5]

*Farm Accounts [2½]

*Music and Gymnasium Work [1]

Physiology [5]

Study of Breeds [3]

*Carpentry [2] Carpentry Lecture [1] *Drawing (Farm Buildings) [2] *Blacksmithing [1] Military Drill [1]	or	†Cooking [2] *Drawing (Farm Houses) [2] Home Management [1] *Physical Culture [1]

SECOND YEAR.

FIRST TERM.

Dairy Chemistry [2]

*Dairy Husbandry [2½]
- Dairy Lectures
- Dairy Practice
- Dairy Breeds

Fruit Growing [3]

Music and Gymnasium Work [1]

Algebra [5]

Breeding [2½] *Military Drill [1] Physics [5]	or	*Cooking [2] Household Art [1] *Physical Culture. *Sewing [2]

SECOND TERM.

Agricultural Chemistry [5]

Dairy Husbandry [2½]
- Dairy Stock Lectures
- Dairy Practice
- Dairy Feeding

COURSE OF STUDY—*Continued.*

*Music and Gymnasium Work [1]
Physics [5]
Vegetable Gardening [3]

Field Crops [5]
*Military Drill [1]

or

*Cooking [2]
Home Economy [1]
*Physical Culture [1]
*Sewing [2]

THIRD YEAR.

FIRST TERM.

*Agricultural Chemistry [5]
Forestry [3]
*Music and Gymnasium Work [1]
Entomology and Zoology [5]
Poultry [3]

*Handling Grain and Machinery [1]
*Veterinary Science [2½]

or

*Cooking [2]
*Sewing [2]

SECOND TERM.

Civics or Geometry [4]
*Dressing and Curing Meats [1]
Plant Propagation [3]

Feeding [3]
Soils and Fertilizers [5]
*Veterinary Science [2½]

or

*Cooking [3]
Domestic Chemistry [3]
Domestic Hygiene [1]
*Sewing [3]

Figures in brackets indicate the number of hours per week in which the subject is pursued. All work in subjects marked thus extend through double time in the daily program.

†Three periods.

One essay and one declamation are required of each student in each term of the first two years. Those taking the regular work in the literary societies will be excused from the declamation.

ASSEMBLY.

On each school day at 11:40 a. m. the students assemble in the chapel. After the opening exercises brief talks are given by the principal, members of the faculty, and invited guests, on the subjects of history, economics, ethics and psychology.

Members of the graduating class will, at this period, discuss the best books in literature and articles on public questions as they appear in the leading magazines.

This plan gives to the students, in the course of the year, many things which will strengthen their lives for meeting the demands of citizenship in the rural communities.

SCHOOL OF AGRICULTURAL—PROGRAM, WINTER TERM, 1902.

INSTRUCTOR.	8:15-9:00	9:05-950.	9:55-10:40.	10,45-11:30.	11:40	1:15-2:00	2:05-2:50	2:55-3:40.	3:45-4:30.	4:35
Aldrich					ASSEMBLY.	C Drawing, 2, 5, or 1, 4.		C Drawing, 2, 5, or 1, 4.		
Blair						B Sewing, 2, 4.		A Sewing, 1, 3, 4.		
Boss, A.						Dressing and Curing Meats. 2 pds.				
Boss, W.						C Carpentry, 1, 4, or 2, 5.	Carp. Lec.3.	C Carpentry, 1, 4, or 2, 5. Carp. Lect. 3		
Cole										Mili. Drill.
Drew						Blacksmithing, 1, 4 or 2, 5.		Blacksmithing, 1, 4, or 2, 5. Blksm. Lect. 3.		
Green	II, III, IV B Veg. Gard. 2, 3, 4,			I. B. Veg. Card 2, 3, 4.		A Plant Prop., 1, 4.		A Plant Prop. 5.		
Haecker						B. Dairy Stk. Feeding, 1, 5	B Dairy Practice, 1, 3 or 5.			
Hays	II, IV. C Agr. 1, 2, 3.	III. B Field Crops.	II. IV. Field Corps.							
Keyes						P Geog.	P History.	P History.		
Koerner							Music, 6:15 to 7:09 p. m., 1, 4, or 2, 5.			
Mahood	P. I. Arith.	A Civics, 1, 2, 3, 4.	P. II, Arith.	A Civ. 1,2,3 4.			Gymnastic Work at 8:30 p. m., 1, 4, or 2, 5.			
Meredith			(B) Home Econ., 5.	C I Home Manage. 5.						
Pendergast	G English.	C. IV. Eng.	C. I. IV. Eng.	C. II. Engl.						
Reynolds		C. III. Physio.	C. I. Physiol.					A Vet. Sci., 5 pds 2, 4.		
Robertson	B. I. Physics.	B. II Phys.	B. III Phys.	B. IV. Phys.						
Shaw	C. II, IV. Study of B. 1, 2, 3.	C. I. Study of B. 1, 3, 5.				A Feed 2, 3, 5.				
Sheppard						A Cooking, 2, 3, 5.		B Cooking, 2, 3, 5.		
Snyder	A Domes. Chem., 3, 4, 5.	I. IV. B Agr. Chem.	Soils & Fert.	II. III. B. Agr. Chm.					C Cook, 1, 4,	
Tucker		A Geom. 1, 2, 3, 4.	G. Geom.	G. Algebra.						
Vye	Penmanship.					C Accounts, 2, 5, or 1, 4, 5, Pds. Acc. Lect. 3.		C Accounts, 2, 5, or 1, 4, 5 Pds.		
Whitridge		C. I. Phys. Tr. 2 4.	B. I. Phys. Tr. 2, 4.							
Wheeler	C. I, Plant Study,	C. II. Plant Study.	C. III. Plant Study.	C. IV. Plant Study.						

SCHOOL OF AGRICULTURE—PROGRAM, FALL TERM, 1901.

INSTRUCTOR.	8:15-9:00	9:05-9:50	9:55-10:40	10:45-11:30	11:40	1:15-2:00	2:05-2:50	2:55-3:40	3:45-4:30	4:35
Aldrich					ASSEMBLY.	C Drawing 2. 5, or 1, 4		C Drawing 2, 5 or 1, 4		
Blair						B Sewing, 2, 4		A Sewing 2, 4		
Boss, A						C Sewing, 1, 3, 5		C Sewing 1, 3, 5		
Boss, W		A Power of Machinery, o					A Handl'g Grain & Mach'ry			
Cole						C Carpentry 1, 4 or 2, 5	X Carp Lec 3	C Carpentry 1, 4 or 2, 5	Y Carp Lec 3	Mili. Drill.
Drew		A Poultry 1, 2, 3	A Poultry 1, 2, 3			C Blacksmithing 1, 4 or 2, 5		C Blacksmithing 1, 4 or 2, 5 Blksm Lect 3		
Green			II and IV B Fruit Cult. 1, 2, 3	II and IV B Fruit Cult. 1, 2, 3		A Forestry 1, 2, 3				
Haecker						B Dairy Lecture 1 5 Breeds 1, 5	B Dairy Practice 1, 3 or 5			
Hays	II and IV Agricul 1, 2, 3	C Field Agriculture 1, 3, 5		III C Agriculture 1, 2, 3						
Keyes						P Geog	P History	P History		
Koerner							Music 6:15 to 7:00 p. m. 1, 4 or 2, 5			
Lugger	A Entomol'y and Zoology									
Mahood	II and IV B Algebra	I and III B Algebra	P I Arithm'c	P II Arithm'c			Gymnastic Work at 8:30 p. m. 1, 4 or 2, 5			
Meredith				C Soc. Cult. 5			B Household Art 1			
Pendergast	G English	P English	I&IV C Eng.	II C English						
Reynolds		III C Physiology	I and IV C Physiology					A Vet. Science 5 Pds. 2, 4		
Robertson	I B Physics	II B Physics	III B Physics	IV B Physics						
Shaw	II and IV C Study of Breeds 1, 2, 3					B Breeding 2, 3, 4				
Shepperd						B Cooking 3 A Cooking 4, 5		C Laund. 2, 5	Laund 1, 4 B Cooking 4	
Snyder		A Agl. Chem.	II and IV B Dairy Ch'y 4, 5	III and I B D'ry Chem 4, 5 A I Lab Ag Chem 1,2,3,4				Laboratory Agr. Chem. A II, 1, 3		
Tucker		G Geometry	G Algebra			(C Accounts 1, 4 or 2, 5 5 Periods) (Accounts Lecture 3		(C Accounts 2, 5 or 1, 4 5 Periods.)		
Vye	Penmanship.									
Whitridge		C Physical Training 2, 4	III B Physical Training							
Wheeler	C I Plant Study	C II Plant Study	C III Plant Study	C IV Plant Study						

CHARACTER OF INSTRUCTION.

AGRICULTURE.

The instruction in agriculture continues through the course and is outlined as follows:

Instruction is given in the selection and management of farms; soils and soil formation; drainage; tillage; road making and fence building. The production of grains and grasses, clovers and other forage plants; the management of grass lands; the rotation of crops; and the management of fields in relation to fertility, to weeds, to live stock and to profits,—are considered. Many special subjects, such as breeding field crops, exterminating noxious weeds, etc., are dealt with. Green manuring, management of farm manures, and the place of commercial fertilizers in field management in various parts of the state are discussed.

University experiment farm is conducted partly with reference to instruction. A number of students are engaged each summer to assist in the experimental work with field crops and field management, also the preservation of crops in silos and other ways. Many conveniences on the farm serve as models of their kind. A museum of a limited number of the best modern farm machines is maintained.

AGRICULTURAL CHEMISTRY.

The first term is devoted to the study of the general principles of the science of chemistry, particular attention being given to those elements and compounds which are the food of plants and animals. The work is illustrated by the many chemical changes which take place on the farm. The student spends a part of his time in the laboratory performing experiments relating to the subjects which are studied in the class-room.

In the second term the chemistry of farm products is begun. The composition of human and animal food stuffs forms an important part of this term's work. The chemical changes which take place during the growth of crops are studied, as well as the various factors which influence the food value of agricultural products. During this term one period each day is given to a class-room exercise, and one period is given to laboratory work. In the laboratory the student separates the various compounds of which food stuffs are composed, and he also studies the various types of food materials.

One term is given to the chemistry of soils and fertilizers. The require ments of the various farm crops in the way of food and the best ways of satisfying these demands are considered. The various forms of plant food which exist in the soil, the chemical changes which the plant food undergoes, and the power of crops to make use of the various compounds of the soil, form important parts of this work. In the study of soils and fertilizers, it is the aim to study the principles which govern the maintenance of the fertility of the soil.

In the chemistry of dairying, iestruction is given in the chemical and allied changes which take place in the handling of milk and in its manufacture into butter and cheese.

ALGEBRA.

Algebra is required during the first term of the second year. This work covers Wells' Elements to highest common factor. Special attention is given to literal notation, negative numbers, the equation and factoring.

The work in the additional fourth year covers Wentworth's Elements to logarithms.

ANIMAL INDUSTRY.

The talks on animal industry are most practical. The characteristics of the leading pedigreed breeds that have special adaptation to northwestern conditions are discussed. The points of good and inferior animals in beef, cattle, sheep and swine are so taught that the student may learn to choose wisely when selecting foundation animals from which to breed or animals to prepare for the block. The fundamental principles that govern breeding are pointed out in the simplest manner possible. The feeding of animals is discussed. Special prominence is given to the choice of foods for live stock at the different stages of their development and to the preparation of the same for breeding. The general principles which relate to the care and management of cattle, sheep and swine are made clear. And as far as practicable these talks are illustrated by the presence of living specimens of the various animals under discussion.

ARITHMETIC.

Students entering the preparatory class in arithmetic are required to understand arithmetic through fractions, both common and decimal. The course gives special attention to denominate numbers, percentage in its various forms, interest, discount, evolution and mensuration. The aim is to secure both accuracy and facility in the most practical operations.

BLACKSMITHING.

The students are instructed in the management of the forge and fire, and in bending, shaping and welding iron and steel. They are required to make links, rings, hooks, bolts, clevises, whiffletree-irons, tongs, cold-chisels, punches; in short, to become familiar with all the operations necessary to enable them to do their own repair work when they return to the farm. Particular attention is given to rapid and accurate welding and to the shaping and tempering of steel tools. The forges used are such as any farmer can make for himself, and each student is taught to make his own tools, so that he will be able to furnish his shop with very little outlay.

CARPENTRY.

Instruction is given by means of text-books, lectures, and work in the shop and drawing room in the care and use of tools, including setting and filing saws, filing bits, grinding plane irons, chisels and other tools; also in laying out work and framing buildings. Methods of construction are illustrated by models and drawings. Various articles for use about the farm are manufactured by the students.

CIVICS.

During the last term of the course students receive instruction in this science, and graduate with a good understanding of the origin, necessity, nature and various forms of government, and the machinery employed to carry on public works, establish justice and provide for the common defense; of the organization and management of local institutions, the town, the village, the city, and the county; the manner in which states are created and their affairs administered; the three departments,—legislative, judicial and executive, and the functions of each; the interdependence of the state and its citizens, as well as the powers and obligations of each, by due attention to which the state may be strengthened and the condition of its citizens ameliorated.

The relation of the state to the general government; the constitution and the powers it confers; and the provisions for amendments,—are taught. The more important principles of commercial law, including contracts, agency, partnership, corporations, and commercial paper, receive attention. Instruction is also given in the United States method of surveying public lands.

COOKING.

The course in cooking extends through five terms of the curriculum as given below, with the subjects covered in each term.

Second term, C year—Kitchen management; care of cooking utensils, glass, china and silverware; measuring and invoicing; cooking vegetables, cereals and breads.

First term, B year—Cooking meats, preserving fruits and vegetables.

Second term, B year—Eggs, beveridges, soups, salads and table service.

First term, A year—Marketing and care of foods; dairy dishes, made over dishes, invalid cooking.

Second term, A year—Desserts, food rations, dietaries, confections, bills of fare and dining room.

DAIRY HUSBANDRY.

Farm Dairy Lectures—During the first term a course of lectures is given in farm dairying, giving instruction in the care of milk and utensils, explaining the principles involved in creaming milk by the gravity and centrifugal processes and giving full instruction in regard to running farm separators and the manufacture of butter and cheese in the farm dairy.

Dairy Practice—Students receive practical training in the most advanced methods of creaming milk, ripening cream, churning, working and packing butter, the manufacture of sweet curd cheese, and measuring the value of milk by the Babcock test and lactometer. This practice work begins the third week of the first term and continues through the school year.

Dairy Stock—During the last half of the first term students receive instruction in regard to characteristics of the various breeds of dairy cattle, their origin and comparative adaptability for the dairy. Lectures are given upon the points essential in animals intended for the dairy. The students have practice work in judging dairy stock.

Feeding—During the second term lectures are given covering both the scientific and practical phases underlying the principles of feeding. Practice work is given in compounding rations and estimating the comparative value of food stuffs.

DOMESTIC CHEMISTRY.

In domestic chemistry instruction is given in the chemistry and economy of human foods. Simple tests for the detection of the adulteration of foods are given. The chemistry of cleaning material and the composition of various household articles are considered. The instruction is given in the form of laboratory practice.

DRAWING

The student is taught the practical value of drawing for the purpose of designing and arranging buildings, machinery, etc. He makes drawings of the shop exercises then works from his own drawings, thereby learning the application.

Designs are made for dwellings, barns, out-buildings, and machinery. As practical subjects for their designs students are requested to bring from home data for plans of buildings needed on their farms. Estimates are made of the amount of material required and cost of construction.

DRESSING AND CURING MEATS.

Instruction is given in a course of lectures and demonstrations.

Two weeks' practice work in dressing, curing and cutting up beef, pork mutton, veal, and poultry is required of each student before graduation.

ENGLISH.

Course I. (*C*) The first year's work in English consists of almost daily practice in the simpler forms of composition and the study of the more important grammatical relations. Applicants for admission to the C class should be familiar with the inflections of nouns, pronouns and verbs, the definitions and classifications of phrases and clauses, and the common case constructions.

Course II. (*B*) Once a month throughout the school year, the members of the B class will prepare essays of about a thousand words, and submit them for criticism.

Course III. (*A*) As noted elsewhere in this catalogue, during the year 1901-2 a series of literary programs will be presented in chapel by the members of the graduating class. The numbers will include abstracts of leading magazine articles, biographical sketches, book reviews and selections from fiction; special prominence will be given to authors depicting American life.

Course IV. (*G*) This is a new two-term course designed especially for students intending to enter the University but open to all A's. Two periods a week will be devoted to composition with Scott & Denney's Composition-Rhetoric as a text-book, and three to the study of literature, which will also be made the basis of considerable written work. In the year 1901-2 the class will study characteristic works of the following authors: Shakespeare, Bacon, Milton, Addison, Gray, Goldsmith, Burns, Wordsworth, Coleridge, Lamb, Scott, Carlyle, Macaulay, George Eliot, Ruskin, Browning and Tennyson. Individual members will be assigned readings in various other authors.

ENTOMOLOGY

The class in entomology receives instruction of a practical nature. The course is divided as follows:

Clasification of insects sufficient to enable the student to distinguish between useful and injurious insects and to apply remedies intelligently, as the remedies must be selected according to the kind of insect to be combated.

Insecticides and their application; the most approved methods of using arsenic poisons, kerosene emulsions, and other preparations,—are taught.

Natural remedies and nature's methods of preventing increase of injurious insects receive due attention so as to enable the student to apply their teachings. The relation of other animals to insects is also taught, so that the student may know both his friends and his foes. Special attention is given to injurious and useful insects of Minnesota.

GEOMETRY.

Geometry is offered in the second term of the third year, as an elective in place of civics to those who wish to prepare for a college course. This work covers the first two books of Wells' Plane Geometry.

The work in the additional year covers Wentworth's Plane and Solid Geometry.

HANDLING GRAIN AND MACHINERY.

During the fall term of the third year a course of lectures on the use and selection of farm machinery is given and the principles governing the proper methods of shocking and stacking grain are taught by means of demonstrations and practice work.

HOME ECONOMY.

This work is taught as the just proportion between income and expenditure; the distinction of economy, frugality, and parsimony is considered with reference to a definite proportion in the expenditures which are made for existence, comfort, culture, and philanthrophy. A study is made of the sources of income, especially of the income from the farm in the form of house, food and luxuries. The purchase of clothing, household stores and furnishings is considered from the standpoint of the suitable. The relation of cash and credit to cost is also considered. Attention is given to savings and forms of investment, a bank account and the use of a check book. Each student in this class is required to submit at the close of the term a paper setting forth in detail the use of a certain named income for one year, embracing not only every item of necessary home expense but also an outlay made for travel, luxuries, accident, sickness and other emergencies. The habit of keeping a household account is calculated to strengthen the judgment in making a wise use of money. Therefore an analysis and study of expenditures as here indicated serves to bring clearly before the student's mind the relative importance of the different things which money will procure.

HOME MANAGEMENT.

This includes both housekeeping and home making, and tthe eaching of the subject naturally falls into three divisions, household work, sanitation and family life. The instruction is based upon the belief that housekeeping is as important as it is difficult, and that home making is the noblest form of human endeavor. The points in detail in the preparation of food, the making of clothing, the care of the house and household belongings, and the ordering of the family life are considered in their relation to an adequate plan for home management. To start the student in the correct way of becoming mistress of the business of housekeeping is the end sought. It is believed that for one who knows the reason for the doing there is no drudgery. Therefore students are taught the specific danger that lurks in dust and dirt, in order that they may understand the dignity of the unceasing war which the housekeeper makes upon these forces. The practical benefit to be derived from the knowledge students have gained in the cooking, sewing, laundering and dairy classes is emphasized and shown in its relation to an adequate plan for the daily program for the home. While the science of family life has not been formulated, yet some of its fundamental principles are recognized and may be taught.

HORTICULTURE AND FORESTRY.

Fruit growing is taught with reference to raising fruit for market.

Vegetable gardening embraces the study of garden tillage, irrigation, and rotation of crops; transplanting; formation and care of hotbeds; study of garden insects; and the growing of various vegetable crops.

Plant propagation—In this subject the principles underlying the development of cultivated varieties of plants and seed testing are taught; also the propagation of plants by seed, cuttings, grafting, and budding.

Forestry includes the consideration of the formation and care of wind breaks and shelter belts; the laying out and planting of home grounds; discussions of the hardness, habits, and value of our native and introduced trees; and the methods of propagating them.

The work of the class rooom is illustrated by the orchards, nurseries, forest plantations, gardens and greenhouses on the grounds of the experiment station and by visits to commercial nurseries and greenhouses near by.

HOUSEHOLD ART.

This is taught by a series of lectures treating of the adornment of the house and grounds, noting the distinctive character of the country home, and opportunity for embellishment found in the surroundings. The intention is to show that thought and energy can accomplish as much or more than money in making a farm home attractive; also to show the importance of acquiring correct knowledge and correct taste in order to secure every possible convenience, combined with harmonious forms, colors and styles in walls, draperies, and furniture. The true relation of beauty, use and influence of surroundings upon life and character are considered in connection with the possibilities for improvement that may be found in simple and inexpensive methods.

HYGIENE.

Hygiene as a special study for women considers the health of the family as dependent upon pure food, pure water, personal cleanliness and proper habits, as well as upon heredity. The aim is to show how a correct knowledge of the laws of nature is essential not only to the preservation but to the restoration of health.

Several lectures by a physician will be given upon maidenhood, maternity, motherhood, infancy, and related subjects. These special lectures will be supplemented by the regular lectures in class, thus extending and simplifying the subjects in plain and easily understood terms.

LAUNDERING.

In the first term of C year several lectures are given and practice work is provided in washing, ironing, starching, polishing, cleaning and pressing clothing.

MUSIC.

Instruction is given in this subject, not with the purpose of making trained musicians, but to introduce the students to the elementary principles of this art, and to develope in them a love for this most valuable factor in home and social life.

Illustrated lectures, in which the latest music by the masters is used, are given at stated intervals.

PENMANSHIP AND ACCOUNTS.

In this department the student is taught to write a plain hand with rapidity and ease. The work in accounts is applied to the transactions which the student meets in the various duties on the farm. He is so taught to keep his accounts that he may know at any time the profit or loss of any department of his business, and is thus enabled to plan intelligently.

Attention is given to the different kinds of negotiable paper; the various forms of endorsements and their effect; business forms and correspondence. Everything is made plain and practical, and students can learn to keep accurately and neatly the accounts of an ordinary business.

PHYSICAL CULTURE.

The work in this department is particularly directed to the improvement of nutrition and the correction of faulty habits of carriage and posture, frequently the result of exercise taken in the performance of household tasks which have a tendency to produce overdevelopment of certain muscles, while leaving others almost unused. The course of study includes free gymnastics and the use of light apparatus, supplemented by movements taken from the Delsarte system of expression.

There are two classes, one for elementary and the other for advanced work

PHYSICS.

The general principles of the science are taught, special stress being laid upon those which to the greatest extent enter into the business of the farmer. About half the time is devoted to experimental work, which includes capillarity of soil; diffusion and osmosis of gases and liquids; heating, lignting, and ventilation; farm machinery in particular, pumps, eveners,—especially three and four horse, pulleys, milk-testers, centrifugals, incubators, wind-mills, steam and gasoline engines; friction and lubricants; tensile strength of wire and binding twine of different grades; lightning and lightning protection. The foregoing indicates the character of the work the attempt being to give the student an acquaintance with the laws of nature that he may act with reason and work to advantage.

PHYSIOLOGY.

During the first year students take one term of applied physiology. This is an effort to connect technical physiology with the necessities of every day life. The work includes a study of the general plan and structure of the body and the various individual tissues of which it is composed: also sources of heat and energy, digestion, and the relation of food materials to the various tissues of the body. Considerable attention is given to diseased and innutritious foods, food adulterations and narcotics. The circulation is studied with especial reference to the relation of the blood and lymph to tissue nutrition and tissue waste.

Accidents, including poisoning, are studied for the purpose of giving a giving a practical knowledge of what to do in emergencies. Considerable attention is given to the subject of clothing, the various materials in use being considered with reference to fitness for special purposes. Some time is also given to the study of common physiology, of the organs of circulation, digestion, resperation, nervous system, and the relation of bacteria to the common diseases, especially such diseases as consumption, typhoid fever, etc. A brief study is also given to the subject of digestion in the lower animals.

The class work is illustrated by means of large charts, skeletons, manikins and dissections. Important points of difference between human and animal physiology are pointed out in preparation for the third year's work in the veterinary class. Matters of home and personal hygiene are interwoven with the physiology work.

PLANT STUDY.

This subject is taught with special reference to its bearing upon the everyday problems that present themselves to the farmer and gardener. It is profusely illustrated with flowers and plants from the greenhouse and nursery. Some instruction is given in the use of the compound microscope. Students are thus enabled to study intelligently, in an elementary way, the tissues of plants. By this means they get a clear idea of the general principles of plant structure and vegetable physiology.

POULTRY.

In the instruction in this subject the following will be considered: history and characteristics of the leading breeds of poultry; breeding, feeding, and management of fowls for eggs and for the market; planning, building, and arrangement of poultry houses; managing incubators and brooders. A model poultry house, containing pens of the most improved breeds, incubator cellar, workroom, etc., has been provided, where experimental work and practical instruction are carried on.

SEWING.

The course in sewing consists of five terms' work. During the first term the student receives instruction in the elements of sewing, including different stitches, seams, hems, darning, etc., also practical talks on the use and care of all the implements belonging to the sewing basket. The second years' work consists of cutting and making plain garments, drafting of underwear, children's clothing, shirt waists and cotton dresses, taught by a very simple method, using only the tape line and square.

The third year the more difficult work of dressmaking is taken up; draughting patterns, cutting and fitting of dresses. Lectures are given on textiles, wearing and selection of materials. The study of harmony of color is given special attention.

The course is designed to make each graduate capable of doing all kinds of sewing required in the home.

SOCIAL CULTURE.

A course of lectures is given on the usages of good society, including manners, behavior, the voice, conversation, forms of address, invitations, etc. Attention is directed to the fact that all approved etiquette rests upon the great law of kindness. The importance is shown of personal fitness for society through attention to the laws of health and to personal habits, as well as through the refinement of a cultivated mind and sympathetic spirit. Suggestions are made in reference to reading, literary taste and the choice of books. Especial stress is put on the thought that the family life ought to be the highest expression of good society, and therefore the manners and conversation in the home should be the very best of which one is capable. Next in importance to the power of thinking correctly is the power of approaching others with ease and speaking with tactful directness, and consequently any study or practice intended to cultivate the social nature deserves earnest attention. Some instruction is given in the elementary principles of parliamentary usage.

VETERINARY SCIENCE.

During the A year the students take up a course of study in veterinary medicine, the purpose of which is to fit them for intelligent care of their farm stock. In this course the teaching is done by means of lectures, distribution of mimeographed lecture notes after each lecture, reviews and clinical work at the hospital, maintained for that purpose. Lectures are illustrated by means of charts, manikin of horse, skeleton of horse, and various other appliances.

The lecture consists of a series on each of the following subjects: Elementary anatomy; elementary pathology; cause and prevention of diseases; diagnosis and treatment of common diseases, examination for soundness; and a final short course on common medicines, studying their effects, uses and doses. At the hospital clinics students are enabled to examine and care for a variety of cases and to learn the elements of diagnosis for the more common diseases and forms of lameness.

ZOOLOGY.

Chiefly Minnesota animals are considered: (1) their classification; (2) their habits and food; (3) their relation to the farmer. To assist the students in their work, a museum has been started in which is shown the relation of Minnesota Animals, birds, reptiles, etc., to agriculture. Soils, minerals, fossils, plants—both useful and injurious—are also on exhibition.

CLASSIFICATION OF STUDENTS.

No student with incomplete C or preparatory work will be classified as an A.

No student with incomplete preparatory work will be classified as a B.

No student with incomplete C or preparatory work will be made a commissioned military officer.

SPECIAL COURSE.

Persons of mature age will be admitted to a special lecture course during the ten weeks of the winter term, as indicated in the daily program for special students. A fee of ten dollars will be charged for this course, and special students will not be admitted to the boarding department.

The following subjects will be discussed: Agriculture—soils; fields; growing, harvesting and preserving forage and grain crops; farm development and farm management. Dairy Husbandry—Feeding and judging dairy stock. Animal Husbandry—Breeding, feeding and judging beef cattle, sheep and swine. Chemistry—The composition and value of foods and the conservation of soil fertility. Farm Machinery—Covering farm motive power, as engines, wind mills and pumps and farm implements. Cutting and curing meat—How to cut up and cure the various kinds of meat, and how to select and name the different parts. Farm Horticulture—Lectures on the cultivation of the apple, plum and small fruits, on vegetable gardening, and on wind breaks and ornamental trees. Veterinary—A discussion of the most common diseases of farm animals and how to care for them. Entomology—Common and noxious insects. Poultry—Care and breeding of domestic fowls.

THE FARM STUDENTS' REVIEW.

The Alumni Association of the School of Agriculture is publishing an agricultural paper, the Farm Students' Review, which is now in its fifth year. This is proving a most important agency in the development of the department and of agriculture in Minnesota.

Dairy School.

THE FACULTY.

CYRUS NORTHROP, LL. D., *President.*
WILLIAM M. LIGGETT, *Dean.*
T. L. HAECKER, *Professor of Dairy Husbandry, in charge of School.*
HARRY SNYDER, B. S., *Dairy Chemistry.*
OTTO LUGGER, Ph. D., *Bacteria in Dairy Products.*
W. M. HAYES, M. Agr., *Forage and Pastures.*
M. H. REYNOLDS, M. D., V. M., *Diseases of the Dairy Cow.*
J. A. VYE, *Creamery Records and Accounts.*
WM. ROBERTSON, B. S., *Care of Boiler and Engine.*
C. R. ALDRICH, *Dairy Buildings.*
J. M. DREW, *Silo and Stable Conveniences.*
B. D. WHITE, *Instructor in Butter Making.*
A. J. GLOVER, *Instructor in Cheese Making.*
WM. BOSS, *Instructor in Practical Engineering.*
H. L. SONDERGAARD, *Assistant Instructor in Butter Making.*
SAMUEL HAUGDAHL, *Assistant Instructor in Butter Making.*
JACOB LEHNHERR, *Instructor in Sweet Curd Cheese Work.*
E. W. MAJOR, *Instructor in Dairy Laboratory.*
R. S. PARKER, *Assistant in Dairy Laboratory.*

The next session of the Dairy School will begin January 7, 1902, and continue four weeks.

This course is designed to furnish persons who are actually engaged in the manufacture of butter and cheese, in creameries and cheese factories an opportunity to become more skilled in their work, and also to study the many problems which have a direct bearing upon the dairy industry. Recognizing the fact that such persons cannot be away from business for a long period, the term has been so arranged that the time of each student is fully occupied by lectures and actual work every hour of every working day of the term.

The rapid growth of the dairy industry in the Northwest calls for a corresponding enlargement of the work in dairy instruction. To meet this want the dairy hall has been equipped with the latest and most improved machinery and all apparatus necessary to give instruction in the various lines of dairy work.

No pains will be spared to maintain the high standard which the school has attained. Each member of the faculty has special qualifications for the duties to which he has been assigned. The lecture course and practical instruction are arranged with special reference to giving the greatest amount of traning and practice possible in a four-weeks session. Large additions have been made to the equipment of the dairy hall in both butter and cheese departments; in fact, it has everything needed for conducting the work by the most approved methods.

Instruction is divided into six courses:

1st. Lectures covering the entire field of dairy husbandry.
2d. Practical work daily in the butter room.
3d. Practical work daily in the cheese room, where the manufacture of flats, cheddars, Swiss, brick, Edam, and Gouda cheese will be carried on.
4th. Practice work in the laboratory examining milk, making daily composite tests, and the pasturization of milk and cream.
5th. Practical engineering, steam fitting and plumbing.
6th. Practical work in factory bookkeeping.

I.—LECTURES.

The course of sixty lectures furnishes in a plain and concise form the most valuable information for those who are interested in any branch of agriculture, covering, as it does, the most important points in the breediug, rearing, feeding and general management of dairy stock, the economical production of milk, growing and preserving of forage and grain crops, the management of meadows and pastures, management of barns, stables and yards, construction of silos, co-operative dairying, creamery and cheese factory management, judging and marketing dairy products, the chemistry of milk, dairy bacteriology, engineering, animal hygiene and treatment of the common diseases of the diary cow.

II.—BUTTER MAKING.

The running of separators; ripening and churning of cream; the proper acidity of cream to secure best flavor; how to churn, wash and salt butter so as to avoid specks and mottles; to secure good grain and and best methods of preparing for market—are some of the points which receive special attention. As all creamery men should be able to judge butter from a commercial standpoint, students are trained daily in the art of scoring butter by the score card.

III.—CHEESE MAKING.

The work in the cheese room is conducted on a large scale, including the manufactere of several brands of fancy cheese. The fact that there is a demand for these at highly remunerative prices has induced the Regents to provide the necessary means for carrying on this work.

A complete record of every step taken is required of each student. Here is a good opportunity for cheese makers to meet, investigate new methods, make experiments on doubtful points, compare notes, and thus gather in a few weeks knowledge that otherwise would take years to acquire.

IV.—MILK TESTING.

It has been found that the value of milk for both butter and cheese is measured by the per cent. of fat content, and nearly all our factories and creameries now base the payment for milk on the fat content. It is therefore necessary for every factoryman to familiarize himself with the best methods of milk testing. The chemist gives a general outline of the work, but in order that each student may have thorough training in milk testing, daily exercise is given. Steam, turbine and hand power machines and other apparatus are provided and operated in the laboratory.

The pure and wholesome milk and cream supply for our cities is a matter of vital importance, and there is great need for improved methods of handling milk intended for this purpose. To meet this, milk and cream pasteurizing apparatus of the latest and most approved makes have been provided for the dairy school, and a few advanced students will be given instruction in this work.

V.—MOTIVE POWER.

The work in engineering consists of practical talks on the construction, care and management of creamery engines and boilers, pumps, injectors, heaters, etc., and work in the practice room.

In the practice room is provided an eight horse power simple, slide-valve engine, three types of boiler feed pump, two types of deep well pumps, one injector, two milk pumps, and a steam gauge, which the students have the privilege of examining and operating. Instruction is also given in pipe fitting, placing shafting, babbiting bearings, soldering, etc.

It is the aim to make this work as practical as possible. Questions of interest on the subject are freely discussed.

VI.—FACTORY BOOKKEEPING.

All the essential features of factory accounting from the receipt of the milk to the returns in net proceeds are thoroughly considered. Paying for the milk according to the fat content, or otherwise, is fully explained. The students do, in books provided, the actual one month's accounting of a creamery.

REQUIREMENTS FOR ADMISSION.

Experience has shown that students who have had some practical training in the creamery or cheese factory before coming to the dairy school are, as a rule, the ones who are able to make the most of the course; it is therefore required that persons who intend to take this course shall have had at least one season's experience before coming to the school. No entrance examination is required.

EXPENSE.

A registration fee of $15 is required of each student. Students can board in either city and reach the school by street car, or board can be secured near the school for from $3.50 to $4.00 per week. Each student is required to supply himself with two white suits, including caps, to be worn during working hours in the creamery and cheese rooms. The suits may be procured for about $1 each.

DAIRY CERTIFICATES.

The regents will grant dairy certificates to students who have taken the course and passed a satisfactory examination and in addition have demonstrated by at least one yeor's work in a factory that they have acquired special skill in the art of butter and cheese making, and are thoroughly qualified to take charge of a creamery or cheese factory.

To reach the school from either St. Paul or Minneapolis take the Como Interurban Harriet street car and get off at Dooley avenue.

Address applications for admission to T. L. Haecker, St. Anthony Park, Minn.

The Agricultural Experiment Station.

OFFICERS OF THE STATION.

Wm. M. Liggett, *Director.*
Willet M. Hays, M. Agr., *Agriculturist.*
Samuel B. Green, B. S., *Horticulturist.*
Otto Lugger, Ph. D., *Entomologist and Botanist.*
Harry Snyder, B. S., *Chemist.*
T. L. Haecker, *Dairy Husbandry.*
M. H. Reyrolds, M. D., V. M., *Veterinarian.*
Thos. Shaw, *Animal Industry.*
Andrew Boss, *Assistant in Agriculture. University Farm.*
T. A. Hoverstad, B. Agr., *Superintendent sub-station, Crookston.*
R. S. Mackintosh, *Assistant in Horticulture, Tniversity Ferm.*
Herman H. Chapman, B. S., *Superintendent sub-station, Grand Rapids.*
E. W. Major, B. Agr., *Assistant in Dairy Husbandty.*
J. A. Hummel, *Assistant Chemist.*
J. A. Vye, *Secretary.*

The purpose of the Agricultural Experiment Station of the University of Minnesota is to bring home to the farmers of this state the importance of the practical application of agricultural science and to discover facts and processes that will be of permanent value to the rural husbandry of Minnesota. This station was established in 1887, under an act of congress appropriating funds for experimental work in each state, and since then has published 69 general and 10 press bulletins that embrace a wide range of agricultural subjects included under the heads of dairying, animal husbandry, entomology, botany, horticulture, forestry, chemistry and general agriculture. These bulletins are issued for gratuitous distribution to the citizens of this state, and of each general bulletin sixteen thousand copies are printed. The station is located at University Farm, St. Anthony Park, Minn. Most of its officers are also employed in the school and college of agriculture. Its equipment consists of 250 acres of land, embracing a variety of soils and exposures; a large general purpose and stock barn; a good sheep barn; piggery, and hennery; a collection of various breeds and kinds of animals; nurseries; forest and small fruit plantations; orchards; gardens; greenhouses; and museum. The offices, laboratories and work rooms of the school of agriculture are also used for the work of the experiment station, which has become widely and favorably known in this and other states. Several of the railroads in the state make a point of encouraging the farmers along their lines in visiting the station by giving reduced rates for this purpose. The work at University farm is supplemented by the sub-station located at Grand Rapids, on land that is characteristic of the northeastern part of the state, and by the sub-station located at Crookston, on land that represents the soil of the Red River Valley. Each of these farms is equipped with buildings and machinery and is in charge of a competent superintendent. Experiments are also carried on at the farm of Supt. O. C. Greeg, in Lyon county (Coteau Farm), which is typical of the agricultural lands of that section.

PUBLICATIONS OF THE AGRICULTURAL DEPARTMENT.

BULLETINS OF THE EXPERIMENT STATION FOR 1900.

Bulletin 68—Sub-Experiment Farms.
Bulletin 69—Bugs Injurious to Our Cultivated Plants.

THE

COLLEGE OF LAW.

The College of Law.

FACULTY.

Cyrus Northrop, LL. D., President.

William S. Pattee, LL. D., Dean, and Professor of Law. *Equity and International Law.*

A. C. Hickman, A. M., LL. B., Professor of Law. *Pleading and Practice.*

James Paige, A. M., LL. M., Professor of Law. *Torts and Criminal Law.*

Edwin A. Jaggard, A. M., LL. B., of the Ramsey County Bench. *Taxation.*

Henry J. Fletcher, Esq., of the Hennepin County Bar. *Contracts and Real Property.*

Howard S. Abbott, B. L., of the Hennepin County Bar. *Corporations.*

Robert S. Kolliner, LL. B., of the Hennepin County Bar. *Personal Property.*

LECTURERS.

George B. Young, LL B., St. Paul, Minn. (Ex-Associate Justice of the State of Minnesota.) *Conflict of Laws.*

Hon. James O. Pierce, Minneapolis, Minn. (Ex-Judge of the Circuit Court of Memphis. Tenn.) *Constitutional Jurisprudence and History.*

Hon. C. D. O'Brien, St. Paul, Minn. *Criminal Procedure.*

Hon. John Day Smith, LL. M., Minneapolis, Minn., *American Constitutional Law.*

Hon. Herbert R. Spencer, Duluth, Minn., *Admiralty Law.*

John Cochrane Sweet, LL. M., Minneapolis, Minn., *Mortgage Foreclosure.*

Jared How, LL. B., St. Paul, Minn., *Landlord and Tenant.*

Ransom J. Powell. LL. M., *Instructor in Justice Practice.*

The College of Law

of

The University of Minnesota.

Object.

It is the object of the College of Law of the University of Minnesota to educate its students by means of the study of Jurisprudence, and at the same time to so familiarize them with the fundamental principles of positive law that they will be able, at the end of their course, to safely enter upon the duties of the legal profession. Education, and not simply information, is the prime object. The power to think clearly, to reason cogently, to perceive distinctions quickly, to investigate thoroughly, to generalize carefully and to express his thoughts accurately are the basal qualifications of the safe counsellor. To secure for the students these habits of thought and expression should be the aim of both the student himself and his instructor.

The method of work generally pursued in the College is threefold. First. The reported cases, being the original repositories of the principles of law and equity, are read by the student and considered in the class-room. To facilitate the work and save expense for the student, volumes of these cases are reprinted and put, free of charge, into the hands of the student during the continuance of the subject, and each subject is pursued daily until its completion. Second. Besides reading the cases, the student in most subjects is required to prepare a written analysis of each case, stating. in his own words, the issue upon which the case turns, the law which governs it, a brief statement of the facts, and the conclusion which the law and facts logically necessitate. This practice has proved helpful in securing a greater thoroughness in reading, greater carefulness in reasoning and greater accuracy on the part of the student in the art of expression. Third. But, in addition to the student's investigation of the cases, and his presentation of them to his instructor, a systematic and orderly arrangement of each subject in the form of a summary, and much additional information regarding the details of the law's application in particular instances, and a consideration of the exceptions, limitations and statutory modifications of general principles, and especially information regarding the art of practice, are indispensible, and are in most instances supplied by printed lectures prepared for that purpose, or by well written text-books upon the subject under consideration. *Information*, as well as *education*, is necessary to prepare a student to begin the practice of law. So far as possible he should, at the end of his course, grasp the various subjects of law in the unity of a system, and to do this he must, in many instances, take the generalizations of his instructor, or take them from some text-book, until he shall find time to investigate the subject for himself.

REQUIREMENTS FOR ADMISSION.

Graduates of universities or colleges, and students who have graduated from any normal school or State high school of Minnesota, or from similar institutions of equal grade in other states, are admitted without examination upon presentation of their diplomas.

All other applicants must pass an examination in the studies required for admission to the freshman class of the college of science, literature and the arts, which are as follows:

N. B.—Time element, as indicated with each subject, is essential.

A three years' course of reading in the English classics.
English Composition, one year.
Algebra, elementary, one year.
Algebra, higher, one-half year.
Geometry, plane, one year.
Geometry, solid, one-half year.

In addition to the above named subjects, which are required for all courses, and for which substitutes cannot be accepted, applicants shall present evidence of preparation in **eight** year-credits, or their equivalent, to be chosen from the following list:

Latin,
Grammar (one year-credit.)
Cæsar, four books (one year-credit.)
Cicero, six orations (one year-credit.)
Vergil, six books (one year-credit.)

Greek,
Grammar (one year-credit.)
Anabasis, four books (one year-credit.)

German,
Grammar (one year-credit.)
Literature (one year-credit.)

French,
Grammar (one year-credit.)
Literature (one year-credit.)

English,
Latin element (one year-credit.)
Literature (one year-credit.)

History, Greece and Rome (one-half year-credit.)
England (one-half year-credit.)
Modern (one-half year-credit.)
Medieval (one-half year-credit.)
Senior American (one-half year-credit.)

Civics (one-half year-credit.)
Political economy one-half year-credit.)
Physics (one year-credit.)
Chemistry (one year-credit.)
Botany (one-half or one year-credit.)
Zoology (one-half or one year-credit.)
Astronomy (one-half year-credit.)
Geology (one-half year-credit.)
Physiography (one-half year-credit.)

N. B.—By a **year credit** is meant, a full year's work upon one subject, five recitations per week, as given in an ordinary high school course.

Substantial equivalents may be substituted, and a business education, as well as experience in teaching may be accepted in lieu of some of the less important subjects.

SPECIAL STUDENTS.

Persons who are not candidates for a degree may enter the college at any time as special students, without examination, and may pursue whatever subjects they desire, provided they possess such knowledge and ability as will, in the opinion of the faculty, enable them to pursue the subjects of law with profit to themselves. And all such students will be entitled to a certificate upon a satisfactory examination in the subjects pursued by them, stating the time they have been members of the college and the subjects in which they have passed a creditable examination.

Such students, however, if they elect studies in both the day and evening courses, pursuing both at the same time, will be charged ten dollars per term additional tuition.

Students in the day or evening classes, will not be permitted to attend more than two courses of lectures daily, unless in exceptional cases and then a card of admission must be procured from the faculy and ten dollars per term additional tuition must be paid.

Students who are regular members of one class, either day or evening, will not be permitted to pursue studies in any class in advance of that to which they belong, unless there are special circumstances requiring it, and only upon special permission granted by the faculty.

SENIOR ELECTIVES.

Students in the senior class of the college of science, literature and the arts, are permitted to elect as one subject throughout the senior year, work in the college of law, including the elements of contracts, domestic relations, torts and criminal law. The satisfactory completion of the above named subjects will give the student a senior credit, and will entitle him to admission to the middle class of the college of law. No such student will be permitted to take more than one lecture each day in the college of law, without special permission of the faculty of the college of science, literature and the arts.

ADVANCED STANDING.

Should any person desire to enter the middle or senior class for a degree he must be at least nineteen years of age, must pass the required preliminary examination upon the subjects of the preceding year or years, or their equivalents, but no person will be allowed to receive his degree who has not spent one full year in this department. Attorneys at law, however, who have been admitted to practice in the state of Minnesota, may enter the senior class without examination upon presentation of their certificates of admission, and shall be entitled to their degree upon a satisfactory showing at the final examination of the year.

Applicants who have diplomas entitling them to admission without examination, should present them to the registrar of the university, who, upon the payment of the matriculation fee and the first term's tuition, will register them as students of the college.

Those who are to take examinations or enter as special students, should present themselves to the Dean of the college of law, who will, upon proof of their qualification for admission refer them to the registrar and accountant, where they pay the matriculation fee and the first term's tuition.

FOUR COURSES OF STUDY.

First.

THREE YEARS' DAY COURSE.

FIRST YEAR—JUNIOR.

Contracts, including the statute of frauds; domestic relations; agency; commercial paper; common law pleading; torts; real property, (Blackstone second book); criminal law. (Seniors from the academic department are entitled to only one lecture daily, without special permission.)

SECOND YEAR—MIDDLE.

Real property continued (land, estates, titles); personal property, including sales; partnership; code pleading; bailments; corporations—private and public; mortgages; suretyship; liens; carriers and insolvency law; wills and administrations; landlord and tenant; insurance.

THIRD YEAR—SENIOR.

Evidence; equity jurisprudence; real property continued; taxation; practice in the United States Courts; American constitutional law; medical jurisprudence; international law; extraordinary legal remedies; conflict of laws; conveyancing; trusts; personal property; patent law; moot court work.

The subjects as above arranged are not necessarily taken up in the order they are mentioned, but the topics of the first, second and third years will be considered during those years in the order named, subject, however, to such re-arrangement as may best subserve the interests of the students and the convenience of the lecturers and instructors.

Second.

THREE YEARS' EVENING COURSE,

To accommodate those who cannot attend the lectures during the day, there is offered an evening course comprising the same subjects as those above enumerated, extending over a period of three years, of nine months each. The students in this course pursue the same subjects as those in the day course, and in the same order, except that the senior and middle classes are united, and the work of those two years is arranged to meet the demands of such a union.

Third.

SPECIAL COURSE.

For the benefit of those who do not care to pursue an extended course of legal instruction leading to the degree of bachelor of laws, (LL. B.), but desire such a knowledge of law as is of inestimable value to them in a business career, there is offered a special course.

This course extends over one year, and for the accommodation of business men the lectures are delivered in the evening.

The course embraces the following subjects: contracts, including statute of frauds; agency; commercial paper; partnership; Minnesota insolvency law; liens; bailments; master and servant; insurance; sales.

The subjects in this course may be varied upon consultation with the faculty, and other subjects in place may be substituted by those whose business life or whose preference render it desirable.

Those who complete the course and pass a satisfactory examination receive a certificate of proficiency.

Fourth.

GRADUATE COURSE.

First.

For the benefit of those students who wish to pursue their legal studies further than they are able to do in the undergraduate years, two graduate courses are offered, the first leading to the degree of master of laws (LL. M.), the second to the degree of doctor of civil law (D. C. L.)

The courses of lectures offered in the first year of graduate work are as follows:

Philosophic basis of jurisprudence.
Roman law.
Political science.
Constitutional jurisprudence and history.
Theories of taxation.

Those who enter this course as candidates for the degree must have already received the degree of bachelor of laws, from this or some other law college having a three years' course of study. Those who spend the entire year in the work prescribed for this course, and pass a satisfactory examination upon the subjects taken, will be entitled to the degree of master of laws. Any person who possesses the requisite legal learning may, however, enter this course as a special student and pursue any or all of the studies offered.

Second.

Students who have received the degree of LL. B., from this or some other law school requiring three years of study of law for said degree, and who have also received the degree of LL. M., from this or some other school after not less than one year of graduate study, and who have taken high rank in all the studies leading to these degrees, may apply to the faculty for the degree of Doctor of Civil Law. A knowledge of French or German, as well as of Latin is required, and special proficiency in Roman history is necessary to entitle a student to entrance for such degree.

There is no prescribed time within which students are required to do their work in this course, but they must make themselves proficient in the subjects of Roman law, political science, comparative constitutional law, and the philosophy of jurisprudence before any thesis will be accepted from them.

None of the aforementioned degrees will be conferred until a satisfactory thesis is presented to the faculty by the student and the thesis for the doctor's degree must be one evincing original investigation and special excellence.

TUITION.

UNDERGRADUATE STUDENTS.

A matriculation fee of ten dollars must be paid by every student entering the college. The tuition fee is sixty dollars a year, or twenty dollars per term payable in advance at the beginning of each term.

GRADUATE STUDENTS.

The tuition fee for graduate students is thirty dollars payable in advance as follows: Ten dollars each term. In addition a matriculation fee of ten dollars is due from each student entering upon the course who has not previously matriculated in this college. A diploma fee of ten dollars is due from each student upon receiving his diploma.

FREE CASE BOOKS.

In order to protect the College, Bar Associations and State Libraries from the special injury incident to continual use and to facilitate the class work of the college, the Board of Regents have decided to furnish for the use of the students free case books.

LIBRARIES.

The college has a good library containing those English and American reports most frequently cited, digests, dictionaries, and a full and excellent selection of standard text-books. To this collection additions are being constantly made.

Further facilities are afforded the college by the generous action of the Bar Association of Minneapolis in granting to the students the free use of its extensive and ample library located in Temple Court. It contains all the American reports, state and national, and also the English text-books and reports, so necessary for the student in his study of fundamental jurisprudence.

Besides the University and Bar Association libraries, the State library containing all books which a student would have occasion to consult, is located at the capitol,in St.Paul, and is thus within easy reach of the students.

The general library at the University contains about seventy-five thousand bound volumes, besides many thousand volumes of pamphlets, magazines, reports, etc. About one hundred and twenty periodicals are received regularly by the library, not inclusive of technical magazines and newspapers in English and other languages.

Besides the general library of the University, there are several special libraries, consisting mainly of books of reference and current periodicals relating to technical subjects in connection with the several departments of engineering, biology and botany. These libraries are open during the entire day, and the University library is open also in the evening.

METHODS OF INSTRUCTION.

The sessions of the junior, middle and senior day classes will begin respectively at 9:00 and 10:45 o'clock a. m., and 2:00 o'clock p. m.; and those of the evening classes will begin at 7:20 o'clock p. m.

Each subject is continued daily until its completion; and when a class carries two subjects daily one recitation or lecture follows the other immediately in order to save the student the expense and time required in going o and returning from the University.

EXAMINATIONS FOR PROMOTION.

Written examinations will be held at the close of each subject during he middle and junior years, and no student who fails to pass a satisfactory xamination in any of his studies will be advanced to the next higher class

A student thus failing, however, may have another examination during the first week of the next year upon those subjects wherein he failed, and if it proves satisfactory he will be advanced accordingly. Such student may, however, enter the advanced class if he has not been conditioned in more than two subjects, and provided he make up those subjects by taking them in the regular classes where they are taught.

STATE AND UNITED STATES COURTS.

The department is located within easy reach of both the federal and state courts. The United States courts are in session in St. Paul and Minneapolis during the greater part of the school year. The supreme court of Minnesota, the district courts of Ramsey and Hennepin counties, and the municipal courts of St. Paul and Minneapolis are open and in session almost constantly, and afford all the opportunity for witnessing the trial of actual cases which the student will have either time or desire to improve.

COLLEGE COURSE.

As fast as the student becomes acquainted with the primary rights of persons, cases are prepared for his consideration, whereby he may apply the principles of law with which he has become familiar.

There is also established in the senior year a system of college courts corresponding to the justice, the district and the supreme courts of Minnesota, wherein the student may become familiar with the practice and the rules of the courts respectively.

It is the aim of the department to acquaint the student with the practice as well as the theory of law, and to this end the subjects of pleading, evidence, rules of practice adopted by our state courts, methods of securing provisional remedies, appeals from one court to another, the writs of habeas corpus, certiorari, and others of frequent use, conveyancing, drawing contracts and other like practices which comprise the daily work of the general practitioner, will, during the senior year, receive special and careful attention.

Some member of the faculty will preside over each of these courts, and the student is required to prepare appeal papers, bonds, paper books, and to furnish the courts with his points and authorities according to the requirements of law applicable to the various courts of the state.

THE LECTURERS.

All the lecturers in the college are lawyers actively engaged in the practice of their profession. They come to the class-room direct from the bar, bringing with them fresh experiences and the spirit of actual contest. They all possess a high ideal of what a lawyer should be and do, and the student who enters here is expected to come with the fixed purpose of attaining a high degree of excellence in legal acquirments, and to respond in earnestness and with fidelity to the faithful efforts of his instructions in his behalf.

THE LITERARY SOCIETIES.

The students of the college have joined in organizing three literary societies for the purpose of general improvement and for clutivation in the practice of extemporaneous speaking. They hold weekly meetings and derive great benefit from their exercises.

ELECTIVES FROM OTHER DEPARTMENTS.

Students of this college will be admitted, under proper regulations, to work in other departments or colleges of this University, without extra charge and, so far as it does not interfere with their law studies, they are urged to avail themselves of this opportunity to attend lectures and recitations in the other departments. Such elections should be made only after consultation with the faculty. The following subjects are suggested as being particularly suitable: international law, constitutional history and political science. Students who elect such work must complete it in a satisfactory manner before they shall be entitled to receive their law degree.

DEGREES.

The degree of bachelor of laws will be conferred upon students of good moral character who persue the full course in this college and pass an approved examination, and the degree will also be conferred upon those who, having attended another law school for the period of one year, shall also attend two years in this college and pass a like examination.

ADMISSION TO THE BAR.

The legislature of Minnesota in the year 1891, recognized the college of law of the University of Minnesota in the following enactment, whereby students graduating therefrom are entitled to admission to the bar without further examination.

AN ACT to establish a uniform standard of admission to the bar of this State and to punish persons violating the provisions of this act.

Be it enacted by the Legislature of the State of Minnesota:

SECTION 1. As soon as possible after the passage and approval of this act the Justices of the Supreme Court of this State shall appoint from the members of the bar of Minnesota learned in law, one person from each congressional district now or hereafter created, to constitute a state board of examiners in law.

SECTION 2. The term of office of said board shall be as follows:

Three shall be appointed for one year, two shall be appointed for two years, and two shall be appointed for three years, and their successors shall receive their appointment in like manner for terms of three years each; but in case of a vacancy occurring by death or otherwise, there shall be appointed in a like manner a person to serve through the unexpired term of the member to whose place he is appointed.

SEC. 3. That said board shall elect a president, secretary and treasurer; shall have its headquarters at the Capitol of the State; shall have a common seal; and the president and secretary shall have the power to administer oaths; the said board shall at least three times in each year hold public examinations for admission to the bar of the State, which examinations shall be both written and oral, in such place in this State as the Supreme Court shall direct, and at such times as the said board shall determine; the said board shall keep a record of all its proceedings, and also a record of all applications for admission to the bar, and shall enroll in a book kept for that purpose, the name of each person admitted as an attorney at law.

SEC. 4. The said board shall, as soon as practicable thereafter, report the result of all examinations to the Supreme Court, with such recommendations as to said board shall seem just, and the Supreme Court shall, after considering said report and said recommendations, enter an order in each case authorizing or directing said board to reject such applicant or to issue to him a certificate of admission to the bar.

SEC. 5. The said board shall receive from each person applying for examination the sum of five dollars ($5.00) as a fee therefor, and all fees received by said board shall be deposited with the treasurer of said board and applied towards the expenses and compensation of the respective members of said board.

SEC. 6. There shall be paid out of the treasury of said board to each examiner appointed as aforesaid, a compensation not exceeding ten dollars ($10.00) per day and his actual necessary expenses in going to, holding and returning from any such examanations.

SEC. 7. No person shall hereafter be admitted to practice as an attorney and counsellor at law; or commence, conduct or defend any action or proceeding in any of the courts of record of this State in which he is not a party concerned, either by using or subscribing his own or the name or names of any other person or persons, unless he has complied with and been admitted under and pursuant to such rules as the Supreme Court of this State shall prescribe; provided that the provisions of this act shall not apply to or affect persons admitted to the bar of this State under pre-existing laws.

Provided, THAT THE GRADUATES FROM THE LAW DEPARTMENT OF THE UNIVERSITY OF MINNESOTA SHALL, UPON PRESENTATION OF THEIR DIPLOMA FROM SAID UNIVERSITY TO THE SUPREME COURT, OR ANY DISTRICT COURT OF THIS STATE, AT ANY TIME WITHIN TWO (2) YEARS FROM THE DATE OF SUCH DIPLOMA, BE ENTITLED TO A CERTIFICATE OF ADMISSION TO THE BAR WITHOUT ANY EXAMINATION OR FEE WHATEVER, AND SUCH COURT SHALL THEREUPON ENTER AN ORDER AUTHORIZING AND DIRECTING THE CLERK OF SAID COURT TO ISSUE TO SUCH GRADUATE A CERTIFICATE OF ADMISSION TO THE BAR, UPON PROOF SATISFACTORY TO SAID COURT THAT SUCH GRADUATE IS A CITIZEN OF THE UNITED STATES, A CITIZEN AND RESIDENT OF THE STATE OF MINNESOTA; THAT HE IS TWENTY-ONE (21) YEARS OF AGE, OF GOOD MORAL CHARACTER, AND UPON HIS SUBSCRIBING SUCH OATH AS IS NOW PROVIDED BY STATUTE FOR PERSONS UPON THEIR ADMISSION TO THE BAR.

SEC. 8. Any person who shall appear as an attorney or counsellor at law in any action or proceeding in any court of record in this state to maintain or defend the same, except in his own behalf when a party thereto, unless he has been admitted to the bar of this State, shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be fined not less than fifty dollars ($50) nor more than one hundred dollars ($100), and it shall be the duty of the respective county attorneys in this state to prosecute violations of this act; but the District Courts of this State shall have sole original jurisdiction of this offense.

Provided, that any attorney or counsellor residing in any of the other States or Territories wherein he has been admitted to practice law, and who shall attend any term of the Supreme or District Courts of this State for the purpose of trying or participating in the trial or proceedings in such action or proceeding therein pending, may be permitted to try or participate in the trial or proceedings in such action or proceeding without being subject to the provisions of this act.

SEC. 9. Chapter ninety-three (93) of the general laws of one thousand eight hundred and eighty-nine (1889) and section three (3), four (4) and eight (8) of chapter eighty-eight (88) of the general statutes of one thousand eight hundred and seventy-eight (1878,) and chapter one hundred and four (104) of the general laws of one thousand eight hundred and eighty-three (1883) are hereby repealed.

SEC. 10. This act shall take effect and be in force from and after its passage.

EXPENSES.

These depend largely upon the tastes and habits of the individual. Students find no difficulty in obtaining board among the people of the City. Good board can be obtained for $4.00 per week. Students board in clubs at less expense.

For further particulars write to the Dean, W. S. Pattee, and all information necessary for the student will be furnished promptly. The Dean will be pleased to correspond with any one who is thinking of pursuing a course of legal study, and he will gladly aid any student in selecting the proper books. Letters addressed to him at Minneapolis, Minnesota, will receive prompt attention.

THE
DEPARTMENT OF MEDICINE

The Department of Medicine.

THE DEPARTMENT OF MEDICINE INCLUDES THE FOLLOWING NAMED COLLEGES:

The College of Medicine and Surgery.
The College of Homeopathic Medicine and Surgery.
The College of Dentistry.
The College of Pharmacy.

Each college is distinct in the government of its internal affairs, has its own faculty and an independent curriculum, excepting in the studies of anatomy, physiology, chemistry, histology and embryology. These studies, so far as they are required in each course, are pursued by all the students of the department in common.

BUILDINGS AND EQUIPMENT.

The department is resident in four buildings situated upon the University campus, viz: Medical hall, the laboratory of medical sciences, the laboratory of chemistry and the laboratory of anatomy.

Medical hall contains the offices of the deans of the college of medicine and surgery, of the college of homeopathic medicine and surgery and of the college of dentistry; the large amphitheatre and lecture rooms of the several colleges, the library and reading room of the department, the laboratories of anatomy and materia medica, the operating-rooms and laboratories of dentistry and the dental infirmary.

The laboratory of medical sciences is a building especially designed for laboratory uses. One wing of the building is occupied by the college of pharmacy and the department of physiology. It contains the office and private laboratory of the dean of the college of pharmacy, the pharmaceutical and botanical laboratories. the laboratory of organic chemistry, with preparation and stock rooms. The office of the secretary of the college of medicine and surgery, a large lecture amphitheatre, especially arranged for demonstrative work, the laboratories of physiology, physiologic chemistry, practical dietetics, and operative surgery are also situated in this wing.

The center and opposite wing are occupied by the departments of histology and embryology, pathology and bacteriology. Each of these branches has its well-lighted laboratories, preparation-rooms and private study rooms.

Upon the basement floor are laboratory stock-rooms and the animal rooms devoted to physiologic and bacteriologic purposes.

A large laboratory upon the first floor is assigned to the bacteriological work of the State Board of Health.

The laboratory of chemistry is a one-story brick building devoted entirely to the use of this department. It is equipped with amphitheatre laboratories, preparation-rooms, store-rooms, and the private offices of the professor and assistant professor of chemistry.

The laboratory of anatomy is a new two-story and basement building, 35x60 feet. In the basement are the morgue, injecting room, cold storage vaults and engine and apparatus for the carbon dioxide freezing plant. On the first floor are an amphitheatre seating one hundred students, the private offices of the professors and instructors, a private dissecting room and a small laboratory for research work. The entire second floor is devoted to laboratories for practical work in anatomy.

A clinical building has been recently erected and equipped. It is situated in a part of the city most favorable to the development of an out door service and, at the same time, accessible to the students. It is of two-stories and covers 40x150 feet. It affords ample floor space for amphitheatres, waiting rooms, pharmacy and class-rooms for each of the clinical branches. Wards and laboratories, in which section work in medical and surgical diagnosis can be conducted, have been equipped.

The department of medicine is in intimate relationship, through its several faculties, with the hospitals, infirmaries and dispensaries of the cities of Minneapolis and St. Paul. Through these agencies it utilizes, for the benefit of its students, the clinical material of these two large centers of population. The location of the University near the interurban car line enhances the value and convenience of these clinical opportunities.

A medical library, containing some twenty-four hundred volumes and supplied with current periodicals, is open to all the students of the department. The collection has been chosen with special regard to the need for reference work and collateral reading. The general library of the University and the public and medical libraries of Minneapolis and St. Paul are also open to the students of this department.

College of Medicine and Surgery.

THE FACULTY.

Cyrus Northrop, LL. D., *President.*
Parks Ritchie, M. D., *Dean and Professor of Obstetrics.*
Thomas G. Lee, B. S.. M. D., *Professor of Histology and Embryology and Librarian.*
Charles A. Erdmann, M. D., *Professor of Anatomy.*
Richard Olding Beard, M. D., *Secretary and Professor of Physiology.*
Charles John Bell. B. A., *Professor of Chemistry.*
Henry Martyn Bracken, M. D., L. R. C. S., Edin., *Professor of Materia Medica and Therapeutics.*
Frank Fairchild Wesbrook, M. A., M. D., C. M., *Professor of Pathology and Bacteriology.*
Charles H. Hunter, A. M., M. D., *Professor of the Theory and Practice of Medicine.*
Everton J. Abbott, A. B., M. D., *Associate Professor of Practice and Professor of Clinical Medicine.*
J. W. Bell, M. D., *Professor of Physical Diagnosis and Clinical Medicine.*
Charles Lyman Greene, M. D., *Clinical Professor of Medicine and of Physical Diagnosis.*
Henry L. Staples, A. M., M. D., *Professor of Clinical Medicine.*
Charles A. Wheaton, M. D., *Professor of Clinical Surgery.*
Frederick A. Dunsmoor, M. D., *Professor of Operative and Clinical Surgery.*
James H. Dunn, M. D., *Professor of Surgery.*
James E. Moore, M. D., *Professor of Clinical Surgery.*
J. Clark Stewart, B. S., M. D., *Professor of Principles of Surgery.*
Justus Ohage, M. D., *Professor of Clinical Surgery.*
Arthur J. Gillette, M. D., *Professor of Orthopedic Surgery.*
A. B. Cates, A. M., M. D., *Clinical Professor of Obstetrics.*
Alex J. Stone, M. D., LL. D., *Professor of Diseases of Women.*
Amos W. Abbott, M. D., *Clinical Professor of Diseases of Women.*
A. McLaren, A. B., M. D., *Clinical Professor of Diseases of Women.*
John F. Fulton, Ph. D., M. D., *Professor of Ophthalmology and Otology.*
Frank C. Todd, M. D., *Clinical Professor of Ophthalmology and Otology.*
C. Eugene Riggs, A. M., M. D., *Professor of Nervous and Mental Diseases.*
W. A. Jones, M. D., *Clinical Professor of Nervous and Mental Diseases.*
Thos. S. Roberts, M. D., *Professor of Diseases of Children.*
Max P. Vander Horck, M. D., *Professor of Diseases of the Skin and of the Genito-urinary System.*
W. S. Laton, M. D., *Professor of Diseases of the Nose and Throat.*
Arthur Sweeney, M. D., *Professor of Medical Jurisprudence.*

CORPS OF CLINICAL PROFESSORS AND INSTRUCTORS.

J. E. Schadle, M. D., *Clinical Professor of Diseases of the Nose and Throat.*
Burnside Foster, M. A., M. D., *Clinical Professor of Diseases of the Skin and Lecturer upon History of Medicine.*
James T. Christison, M. D., *Clinical Professor of Diseases of Children.*
C. Nothnagel, M. D., *Clinical Professor of Medicine.*
John T. Rogers, M. D., *Clinical Instructor in Surgery.*
Herbert W. Davis, M. D., *Clinical Instructor in Obstetrics.*
George M. Coon, M. D., *Clinical Instructor in Genito-Urinary Diseases.*

L. A. Nippert, M. D., *Clinical Instructor in Medicine.*
Andrew M. Henderson, M. D., *Clinical Instructor in Medicine*
J. L. Rothrock, M. D., *Clinical Instructor in Pathology.*
L. B. Wilson, M. D., *Senior Demonstrator of Pathology.*
S. M. White, B. S., M. D., *Assistant Professor of Pathology and Bacteriology.*
George D. Head, B. S., M. D., *Instructor in Pathology and Clinical Microscopy.*
H. C. Carel, B. S., *Assistant Professor of Chemistry.*
Winfield S. Nickerson, Sc. D., *Assistant Professor of Histology.*
Margaret L. Nickerson, M. A., *Instructor in Histology.*
M. Russell Wilcox, M. D., *Demonstrator in Physiology.*
Eleanor M. Wilkinson, *Instructor in Dietetics.*
J. Warren Little, M. D., *Clinical Instructor in Surgery.*
Geo. E. Senkler, M. D., *Clinical Instructor in Physical Diagnosis.*
A. W. Dunning. M. D., *Clinical Instructor in Nervous and Mental Diseases.*
Frederick Leavitt, M. D., *Clinical Instructor in Obstetrics.*
A. E. Benjamin, M. D., *Clinical Instructor in Gynecology.*
Haldor Sneve, M. D , *Lecturer in Mechano-Therapy.*
H. K. Read, M. D., *Demonstrator of Anatomy.*
F. A. Kiehle, A. B.. M. D., *Instructor in Medical Latin.*

CLINICAL AND LABORATORY ASSISTANTS.

J. P. Barber. M. D., *Assistant in Diseases of Children.*
F. P. Wright, M. D., *Assistant in Surgery and Dermatology.*
A. A. Law, M. D., *Assistant in Surgery.*
A. T. Mann, M. D. *Assistant in Surgery.*
F. C. Davis, M. D., *Assistant in Surgery.*
Judd Goodrich, M. D , *Assistant in Surgery.*
Warren Dennis, M. D. *Assistant in Surgery.*
A. R. Colvin, M. D., *Assistant in Surgery.*
C. D. Harrington, M. D., *Assistant in Surgery.*
R. A. Campbell, M. D., *Assistant in Diseases of the Nose and Throat.*
Charles R. Ball, M. D., *Assistant in Nervous and Mental Diseases.*
Harry P. Ritchie, Ph. B., M. D., *Assistant in Gynecology.*
E. F. Reamer, M. D., *Assistant in Ophthalmology and Otology.*
E. V. Appleby, M. D., *Assistant in Ophthalmology and Otology.*
J. C. Litzenberg, M. D., *Assistant in Ophthalmology and Otology.*
Walter Ramsey, M. D., *Assistant in Medicine.*
David Lando, M. D., *Assistant in Medicine.*
E. R. Hare, M. D., *Prosector in Anatomy.*
W. H. Condit, M. D.. *Assistant in Materia Medica.*
L. H. Fligman, M. D., *Assistant in Physiology,*

UNIVERSITY SCHOLARS.

GIVING INSTRUCTION AND ASSISTING IN LABORATORIES.

In Anatomy—C. F. Ewing, H. R. Jones, R, E Mitchell, H. F. McGuigan.
In Histology and Embryology—Eugene K. Green, Herbert Coulter, Harris D. Newkirk.
In Bacteriology and Pathology—J. C. Ferguson, Catherine E. Putnam, John M. Armstrong. Chelsea Pratt.
In Dispensary—E. G. Strout, H. H. Hazeltine, Mary F. Hopkins.
In Materia Medica—H. H. Hazeltine.
In Surgical Pathology—E. Hessel Beckman.

The College of Medicine and Surgery.

RULES AND REGULATIONS OF THE DEPARTMENT.

COLLEGE YEAR.

The fourteenth annual course of study in this department will begin on September 17th, 1901, and will continue eight and one-half months, closing upon the first Thursday in June, 1902. The college of dentistry, in this department, will begin work on September 11th and the college of pharmacy October 2nd.

The college year is divided into semesters; the first semester ending January 25th, 1902. The succeeding week will be devoted to mid-year examinations which will be conducted in many of the departments. The second semester will begin February 4th, 1902, and will close May 17th, 1902, when the final examinations of the year will begin. Commencement exercises will occur in common with the other departments of the University, during the week ending June 2nd 1902.

ENROLLMENT.

It is desirable that students matriculate before September 10th.

Students will be assigned seats in the order of and at the time of their matriculation. Such matriculation and assignment of seats will be had in the office of the registrar of the University. Students will then present themselves for entrance examination, or for the approval of their evidences of preliminary qualification, to a committee of the college of science, literature and the arts appointed for this purpose. Having received an entrance certificate from this committee they will report to the dean of the college which they desire to enter, for admission and classification. They will then be furnished with a record of their standing and of the studies to be taken and they will be required to present this record to the professors in charge of such studies within the first week of the term.

ENTRANCE EXAMINATIONS.

In accordance with an agreement between the University of Minnesota and Hamline University, the requirements for admission to their medical departments, which represent all the medical schools of the state, are, at present, uniform.

During the session of 1901-02 students will be admitted to this college upon passing the regular entrance examinations to the colleges of science, literature and the arts, as unified by the presidents of the University of Minnesota and Hamline University. The subjects of examination are:

English composition and rhetoric, one year.
Physics, one year.
Physiology, elementary course.
United States history, one year.
History of Greece and Rome, one-half year.
Algebra, elementary, one year.
Geometry, plane, one year.

Latin Grammar, one year: Cæsar, four books; Cicero, four orations Vergil, four books.

German or French, two years, or one year of each, will be accepted in lieu of Cicero and Vergil.

Graduates of any Minnesota State high school will be admitted **without examination, provided—**

(1) That the school maintain a **full four-year course** of high school work.

(2) That the applicant present to the dean the principal's certificate showing the satisfactory completion **of all the studies required for admission.**

(3) No student will be admitted **if conditioned in more than two subjects.**

Graduates of the **advanced courses of Minnesota Normal Schools** will be admitted upon the same terms as graduates of State high schools. Any Minnesota high school or academy **not under supervision of the State High School Board,** but requiring for graduation **a four-years' course,** exclusive of the common school branches, conforming **essentially in distribution of time** to the entrance requirements of this college, **may be accredited by the faculty** in all respects as are the State high schools.

Graduates from schools in other states, whose diplomas admit to **reputable colleges,** will be received, subject to the regulations that apply to graduates of Minnesota State high schools.

N. B.—Notice is given that in the session of 1902-3 the requirements for admission to this college will be those for admission to the sophomore class of the college of science, literature and the arts, and that in the session of 1903-4 they will be those for admission to the junior class of said college.

CONDITIONS.

Examinations of conditioned students and of applicants for advanced standing, in the common studies of the first and second years, will be held in these branches upon the following dates:

September 19, 9 a. m. Anatomy, first year; Physiology, second year.
September 19, 2 p. m. Histology, first year; Chemistry, second year.
September 20, 9 a. m. Physiology, first year; Anatomy, second year.
September 20, 2 p. m. Chemistry, first year; Histology, second year.

Conditions may also be removed at the close of each semester.

No student will be eligible to final examinations in any year who carries conditions of a previous year unremoved.

No student will be admitted to the fourth year who is conditioned in any of the studies of the first and second years.

Students who carry conditions into a succeeding year may find a resultant conflict of study hours. In that event they will give preference to the unfinished studies of the lower conflicting course.

CLASSIFICATION.

September 21st and 23rd will be devoted to the classification of students. The opening lecture of the course will be delivered at 8 p. m., September 23rd.

STANDING.

The standing of students is determined by the results of recitations, written examinations and laboratory work. It is indicated by the terms "passed" or "conditioned." Conditions may be removed as indicated above. Incomplete work must be made up before the final examinations of the following year.

Students must pass a majority of the studies of their year in order to classify in the next succeeding year.

In the studies of the first and second years, the classes will recite in sections during hours regularly assigned for this purpose.

Habitual absence without a satisfactory excuse, continued indifference to study, or persistently poor scholarship may subject the student to temporary or permanent suspension.

ADVANCED STANDING.

Applicants for advanced standing must pass the entrance examinations, or present the usual equivalents. They must furnish satisfactory evidence of time spent and subjects covered in previous professional studies and must present themselves at the above dates and pass the examinations in all branches in which they wish to be exempt, excepting under the conditions of collegiate study stated below.

No conditions of advanced standing will entitle the student to take the two years of any graded study coincidently.

Students will not be permitted to substitute private work in any branch for the regular college course work, excepting in the case of actual laboratory exercises done under the direct supervision of an instructor appointed by the chair and approved by the faculty. Examinations in such private laboratory work will be conducted by the chair. This rule does not apply to conditioned students.

Seniors in the college of science, literature and the arts, who contemplate entering the department of medicine, are permitted to elect courses in anatomy, histology and embryology, physiology and chemistry in this department in lieu of similar science courses in the college of science, literature and the arts. Since the medical practice act of this State requires four full years of medical study, these students are encouraged to elect this work in the department of medicine. This election will be contributive toward the degrees given in both colleges. Reciprocally, however, the college of medicine and surgery will accept full courses, taken in the college of science, literature and the arts, in histology and embryology, physiology and chemistry in lieu of its first year's work in these branches.

For a statement of fees, either charged or credited in these elected studies, see below.

ATTENDANCE.

Students are required to attend four-fifths of the lectures in each course. This rule is not intended for the benefit of those who seek admission after the opening of the college year, but is designed to cover cases of sickness or unavoidable absence. It does not apply to laboratory courses which must be taken in full and must be entered, invariably, during the first week in which they begin.

TERMS OF TUITION.

The college of medicine and surgery has adopted a system of annual fees, in which are included all charges for matriculation, lecture courses, laboratory courses, dissections and graduation, except a rental fee for microscopes.* These fees are $100 per annum for the full course.

One-half of the annual fee will be payable when the student matriculates. The registrar's receipt for this portion of the fee will entitle the holder to take the entrance examinations and to classify. The second half will be payable at the opening of the second semester, February 4th, 1902. If the applicant fails to pass the entrance examinations,his fees will be returned by the registrar. Absence or failure to continue study will not entitle the student to return of fees, excepting in cases of special hardship, when application may be made to the executive committee of the Board of Regents.

A student who takes advanced standing will receive only a credit of five dollars upon his annual fee per semester of each laboratory course from which he may be exempt.

Senior students in the academic department of this University who elect first year studies in this college, during their senior academic year, will be admitted to each of such studies upon payment of a fee of fifteen dollars.

Students who are conditioned and fail to remove their conditions within one year will be charged an extra examination fee.

Senior conditioned students who re-enter for work in any succeeding year will be charged a matriculation fee of ten dollars.

BREAKAGE AND LOSS.

In each laboratory course the student will be assigned a certain amount of apparatus and material, for which he will give a receipt.

In each semester a fee of $2.00 will be charged for the rental of a microscope in each course in which its use is required, provided the student is not supplied with a satisfactory instrument of his own It is an advantage for the student to possess a microscope.

For apparatus and material attaching to his laboratory desk he will also be held responsible. At the end of each course, if such apparatus and material are restored in good condition, this receipt will be returned to him.

A deposit of five dollars will be made with the Registrar each year, by every student, at the time of enrollment, as *a caution fee.* This fee is intended to cover the cost of unnecessary damage in the college buildings and of breakage and loss of laborotory apparatus and materials. It will be returned to the student at the close of each year, minus the cost of articles assigned to him, which are not returned in good condition, or of damage to college property for which he is individually responsible. If responsibility for such damage cannot be individually fixed, a pro rata charge upon all students will be made.

SPECIAL STUDENTS.

Special students will pay to the registrar a fee of twenty dollars per year for each study they elect to pursue. They will be charged fees, varying from five to twenty dollars, for each laboratory course they may enter.

Graduate students will pay an admission fee of ten dollars which will entitle them to attend any lectures they may desire in regular courses.

CURRICULUM.

The course in the college of medicine and surgery leads to the degree of doctor of medicine. It covers a period of four years of collegiate study, each year representing eight and one-half months in actual residence.

The studies are graded, so far as practicable, throughout the four years and this grading is arranged with careful reference to the relation which the subjects naturally bear to each other.

The work of the first two years deals with the so-called scientific or laboratory branches; while that of the last two years includes the principles and practice of medicine and surgery, their associated specialties and the application of scientific or laboratory methods to clinical experience.

GRADED SYSTEM OF STUDY.

FIRST YEAR.

Histology and embryology, anatomy, physiology, chemistry.

SECOND YEAR.

Histology and embryology, anatomy, physiology, chemistry, materia medica.

THIRD YEAR.

Surgical anatomy, pathology, bacteriology, clinical microscopy, surgical pathology, operative surgery, practice of surgery, practice of medicine, obstetrics, physical diagnosis therapeutics.

FOURTH YEAR.

Practice of surgery, practice of medicine, clinical obstetrics, surgical pathology, practical physical diagnosis, nervous and mental diseases, gynecology, ophthalmology and otology, diseases of children, genito-urinary diseases, orthopædia, diseases of the skin, diseases of the nose and throat, hygiene.

ELECTIVE COURSES.

The following subjects, arranged in the fourth year, are electives: Operative surgery, therapeutics, practical dietetics, case-taking and life insurance, history of medicine, mechano-therapy and medical jurisprudence.

Senior students are required to elect three of these courses. They will be required to complete and to pass satisfactory examinations upon the subjects elected. The remaining subjects, with the exception of practical dietetics, they may follow at their pleasure, without required examination.

COURSES OF INSTRUCTION.

HISTOLOGY AND EMBRYOLOGY.

The laboratory of histology and embryology occupies most of the first floor and portions of the third floor and basement of the laboratory of medical sciences.

The general laboratory, 44x72 feet, extends across the north wing and is abundantly lighted by large windows on three sides and part of the fourth. Study tables accommodating seventy students are placed directly under the windows. A second tier of desks provides for twenty other students. Each student is provided with a separate locker for the storage of apparatus and material. The special laboratory, 24x35 feet, for research work by advanced students, adjoins the general laboratory. The next apartment, the library of the laboratory, contains a reference library consisting of a small but carefully selected collection of related literature, both standard and periodical. In addition to the laboratory library, the other libraries of the University, together with the public libraries of Minneapolis and St. Paul, afford the student access to the best publications among current periodicals and monographs. The rooms across the hall are devoted to the office and private laboratories of the professor and his assistant. On the third floor are located a preparation room, a small laboratory for special students, a dark room, a room for copying and enlarging, and a laboratory for photomicrography and projection. In the museum on this floor are several cases containg series of embryos and histologic specimens. In the well-lighted basement are found a preparation room, 20x35 feet, for the hardening of tissues, &c., and an experimental laboratory and store room, 26x36 feet.

These laboratories are equipped with seventy-five Leitz' microscopes, each fitted with nosepiece and Abbé condenser, various forms of microtomes, such as freezing, Thoma, Minot, Schanze, &c., injection apparatus, aquaria, thermostats, incubators, water baths, chemical hoods, a great variety of technical glassware, Grübler's stains, a set of His' wax models, photomicrographic and reconstruction apparatus, charts, reference cabinets containing carefully selected slides, a large collection of hardened histological and embryological material with an abundant supply of fresh tissues.

The courses are made as practical as possible, beginning with the technique of the microscope, followed by the preparation of permanent specimens. Collections of typical specimens, also, will be loaned to the students for study. During the two years course the student will acquire a valuable collection of slides of his own preparation illustrating the structure and development of the human body.

The course is illustrated by charts and lantern-slides of histological and embryological specimens. Demonstrations are given under the microscope of typical sections of tissues and organs, accompanied by camera lucida drawings, or photo-micrographs, with explanatory text.

All students are recommended to purchase a microscope at the beginning of their medical course. This instrument is an indispensable part of the outfit of a well-trained physician. Suitable microscopes can be purchased at from $50 to $60, which may be fitted at any time with such other parts as may be desired.

Students not owning microscopes will be furnished with instruments at a rental of $2 per semester for each course requiring the use a microscope.

Course I. General morphology and histology.

Lectures, demonstrations and laboratory work. The course includes the structure and manipulation of the microscope, the structure and properties of protoplasm; the cell, its structure; cell division and reproduction, A detailed study of the structure and life history of certain typical unicellar animal and plant forms and of certain multicellar forms, leading to the consideration of the elements of structure in the vertebrata. A comparative study of the histology of the blood, of the epithelial, connective, muscular and nervous tissues and of the vascular and lymphatic systems. Lectures, etc., 2 hours a week. Laboratory work, 6 hours a week, 1st semester, 1st year·

PROFESSORS LEE AND NICKERSON AND M. L. NICKERSON.

Course II. Elements of embryology and histogenesis.

Lectures, demonstrations and laboratory work. A comparative study of reproduction; the ovum, the spermatozoon, fertilization, cleavage, formation of blastodermic layers, the formation of the embryo, foetal envelopes, etc., with practical work on chick and frog embryos. The differentiation and histo-genesis of the tissues, etc. Lectures, etc , 2 hours a week; laboratory work, 6 hours a week, 2d semester, 1st year. Open to those who have completed course i.

PROFESSORS LEE AND NICKERSON AND M. L. NICKERSON.

Course III. Human embryology and microscopic anatomy.

Lectures, demonstrations and laboratory work. Advanced methods of histological and embryological technique, with practical laboratory work. The comparative study of the morphology, microscopic anatomy, origin and development of the various organs of the integumentary, alimentary, respiratory and uro-genital systems, the central and sympathetic nervous systems, the organs of special sense, etc. Lectures, etc., 2 hours a week; laboratory work, 3 hours a week. 1st and 2d semesters, 2d year. Open to those who have completed the courses of 1st year in histology and embryology.

PROFESSORS LEE AND NICKERSON AND M. L. NICKERSON.

The full courses given in histology and embryology of vertebrates in the college of science, literature and the arts will be accepted in lieu of the first year's work in histology and embryology, in the department of medicine. See statement of fees, page 18.

The following courses are open to properly qualified students, and will consist of practical work in the laboratory, a prescribed course of reading, with reports of work, and of lectures and demonstrations to be given from time to time.

Course IV. Methods of microscopical work.

The preparation and use of the various solutions employed in fixing, hardening and staining; methods of embedding, sectioning, reconstruction, etc.

Course V. (*a*) *Comparative histology and histogenesis of tissues.*

The animal cell, the epithelial, connective, muscular and nervous tissues, blood, etc.

(*b*) *Comparative histology and embryology of the viscera.* The epidermal, digestive, respiratory and uro-genital systems of organs.

(*c*) *Comparative histology and histogenesis of the nervous system and sense organs.* Central nervous system, etc., after the methods of Weigert, Golgi, etc.

Course VI. Comparative embryology of vertebrates.

A detailed study of the various stages in the development of vertebrate types, as acanthias, petromyzon, trout, amblystoma, frog, chick, rat, pig and human embryos.

Research work in histology and embryology.

Opportunity will be offered for those desiring to pursue original investigations.

ANATOMY.

The department of anatomy occupies a separate building, adapted to its work and equipped with the best modern appliances. It includes two large students' dissecting rooms, the general laboratories of anatomy, a bone laboratory for bone research work, the offices of the professor and demonstrator of anatomy, preparation rooms, morgue and anatomical museum, to which has been added a complete series of casts from His' frozen sections. An ample supply of dissecting material is provided.

The bones of the human skeleton are furnished to the student for purposes of study and recitations from the specimen are conducted by the demonstrator of anatomy.

A series of lectures upon syndesmology and angiology follows, accompanied by recitations, which are illustrated by human preparations and by fresh and preserved sections of joints.

A course of descriptive lectures in myology is then given, with demonstrations upon the cadaver.

Lectures and a brief course of dissections of the abdominal and thoracic viscera of the lower animal complete the work of the first year in this branch.

In the second year, the student takes lectures, recitations and demonstrations upon the vascular system, the alimentary canal, the respiratory tract, the genito-urinary system and the inguinal and perineal structures. He then pursues a course in regional anatomy, embracing a study of the surgical regions of the entire body; a course in the anatomy of the eye and ear and of the brain, spinal cord and ganglionic system, illustrated by fresh and permanent preparations, models and diagrams.

He dissects, during the year, the entire human body, recites upon the subject and observes demonstrations made by a corps of assistants under the direction of the demonstrator of anatomy.

In the third year, the student takes up the study of the human body from a topographical standpoint and is given a thorough review of the surgical regions, emphasizing the practical points in the relations, structure and distribution of the nervous system.

Course I. Osteology.

Lectures and recitations upon the human skeleton and supplementary work on the osteology of domestic mammals; three hours each week, for 10 weeks of first semester. Recitations from the specimen, taken by the class, in sections; 2 hours each section, for 10 weeks, first semester. Required of all first year students.

Course II. Syndesmology.

Lectures, recitations and laboratory demonstrations. 3 hours each week, for 4 weeks, first semester. Open to those who have taken course i.

Course III. Myology and Angiology.

Lectures and recitations, covering the entire muscular and arterial systems of the human body, with a supplementary study of comparative myology; 3 hours each week, 16 weeks. Laboratory work consists in identifying the muscles of the human body on dissected preparations and showing their actions. Class, in sections, 4 hours each week, for 5 weeks. Open to those who have taken course ii.

Course IV. Splanchnology.

Lectures on the thoracic, abdominal and pelvic viscera; 3 hours each week, for 10 weeks. Open to those who have taken course iii. Laboratory work in demonstrating and dissecting the thoracic, abdominal and pelvic organs of the human subject or of the dog or sheep. PROFESSOR ERDMANN.

Semi-weekly recitations upon the subjects of the first year's course, conducted in sections. DR. H. K. READ.

Course V. Splanchnology.

Descriptive and topographical anatomy of the thoracic viscera, the alimentary and urino-genital organs. Lectures and recitations, 3 hours each week, for 10 weeks. Required of second year students.

Course VI. Descriptive surgical anatomy.

for 12 weeks, Open to those who have completed course v.

Course VII. The nervous system.

Cerebro-spinal axis and its membranes; the cranial and spinal nerves; the sympa-
Head, neck, trunk and extremities. Lectures and recitations 3 hours each week,
thetic nervous system, and the special-sense organs. Lectures, recitations and dissections of the brain, 3 hours each week, for 8 weeks. Open to those who have completed course vi. PROFESSOR ERDMANN.

Course VIII. Dissections.

This work extends over two periods of 6 weeks each, requiring five afternoons of each week. The method of work follows that laid down in Holden's Manual of Dissections. DRS. H. K. READ AND E. R. HARE.

The second year lecture and dissecting courses are open to those having completed the first year's work in anatomy and histology.

Weekly recitations, upon the subjects of the second years' course conducted in sections. PROFESSOR ERDMANN.

Course IX. Surgical anatomy.

The instruction consists of dissections, demonstrating the relations of structures composing the surgical regions of the body; demonstrations, upon the living subject, showing the anatomical and surgical landmarks and their applications; also the location, by surface tracings, of the viscera contained in the various cavities and of the important arteries, veins and nerves. 1 hour a week, second semester. Required of third year students. PROFESSOR ERDMANN.

Course X. Applied Anatomy of the nervous system.

Elective.

Opportunity is afforded for advanced work in practical anatomy at any time during the college year.

PHYSIOLOGY.

The department of physiology occupies a suite of rooms in the laboratory of medical sciences, including the laboratory of experimental physiology, the laboratory of physiologic chemistry and practical dietetics, a demonstration and recitation room, the laboratory library and the office of the professor in this branch. A large amphitheater, adapted to the demonstration of major experiments, immediately adjoins the physiologic laboratories and is used, also, for lecture purposes by this and other chairs.

In the basement of the laboratory of medical sciences, the chair maintains large and well-equipped animal-rooms, which are furnished with a large aquarium, frog tanks, animal enclosures and breeding cages. From this animal room are furnished supplies of material and animals for the work in experimental physiology, physiologic chemistry, histology, embryology, pathology and bacteriology. The hygienic conditions of the room are studied carefully, with a view to maintaining the physiologic and structural integrity of its animal occupants as perfectly as possible. Stock required for bacteriological purposes is removed and placed in an isolated department at a distance from the room.

The physiologic laboratories are equipped with a full supply of apparatus, instruments, etc., for experimental purposes, and with materials, glassware, digesters, water baths, ventilating hoods, etc., for the work in physiologic chemistry. Their outfit includes sets of vivisection instruments, an artificial respiratory machine, batteries; Du Bois-Reymond coils, galvanometers, rheostats, moist muscle chambers, recording drums, Ludwig's kymograph, spring myograph, Burdon-Sanderson's stethometer, stethoscopes, phonendoscopes, Dudgeon's and Marey's sphygmographs, cardiographs, Runne's chronograph, Roy's tonometer, Gaskell's clamp, oncometers, hæmometers, hæmoglobinometers, hæmatocrits, plethysmograph, etc., etc. They are furnished with motor power for the operation of recording apparatus and for the manufacture of apparatus in the laboratory workshop.

The course in physiology is graded in the first and second years. In the first year, the student hears lectures, recites and attends demonstrations in general physiology. These embrace the discussion and, so far as possible, the observation of the physiologic ingredients of the animal body; the study of the physiology of cell-life, of the fundamental properties of the cell; of the nutritive media, blood, lymph and chyle; of the elementary functions of the nervous system; of the muscular tissues, the connective tissues and the epithelial tissues; of the vascular mechanism; of the alimentary canal; of the organs of secretion, respiration and excretion.

In the second year, the work is made as practical as possible and includes the study of such advanced topics as metabolism, nutrition, dietetics, reproduction; the physiology of foetal life, of infancy, of maturity and of old age; and the functions of the brain, spinal cord and ganglionic system. Three hours each week, during the first semester, are occupied in laboratory work in physiologic chemistry. This course affords the student a practical knowledge of the tissues and fluids of the body from a chemical standpoint. It embraces studies in the several classes of proteids, in fats, carbohydrates, bone, muscle, blood, milk, the digestive fluids, glycogen, etc.

A similar number of hours during the second semester are devoted to experimental physiology. For this work the class is divided into sections and the instruction is individualized so far as possible. The student is familarized with physiologic apparatus and its uses; with forms of electrical stimulation and with methods of experimentation; while his knowledge of physiologic principles is strengthened by the observation of functional facts. Demonstrative work is combined with the individual experiments performed by the pupil.

In the fourth year, an elective course in practical dietetics is conducted during the first semester. It deals with the analysis of foods, with the general principles of food preparation and with the selection of a suitable dietary for the several periods of life.

Practical talks upon the principles and means of food preparation, the serving of food, food selection, invalid and infant dietary, etc., are associated with this course. A trained instructor conducts the exercises in hygienic cooking.

A laboratory reference library is in process of collection, to which the advanced student will have access for collateral reading.

Course I. General physiology.

Lectures, recitations and demonstrations, dealing with the physiologic chemistry of the human body; the physiologic properties of the cell; the nutritive media; the nervous mechanisms in general; the muscular tissues, the connective tissues and the epithelial tissues, as the structural bases of the animal body. Two hours a week, first semester, first year. PROFESSOR BEARD.

Course II. Systemic physiology.

Lectures, recitations and demonstrations. This course includes the physiology of the vascular system; the digestive system; the respiratory system; the secretory and excretory systems. Four hours a week, second semester, first year. Open to those who have completed course i. PROFESSOR BEARD.

Semi-weekly recitations upon the subjects of the first year are conducted in sections of the class. PROFESSOR BEARD, DRS. M. R. WILCOX AND F. H. FLIGMAN.

Course III, Advanced physiology.

Lectures, recitations and demonstrations. The course includes the discussion of the phenomena of metabolism; of nutrition; of temperature production, regulation and loss; of reproduction; of the physiologic changes incident to successive periods of life, and of the functions of the nervous system. Two hours a week, first semester; three hours a week, second semester, second year. Open to those who have completed the courses in physiology of the first year. PROFESSOR BEARD.

Semi-weekly recitations upon the subjects of this course are conducted in sections of the class. PROFESSOR BEARD AND DR. WILCOX,

Course IV. Physiologic chemistry and microscopy.

Laboratory work. A practical study of the several classes of proteids; of carbohydrates, fats, muscle and bone; of gastric juice, saliva, pancreatic juice and bile in their respective digestions; of glycogen, and of blood, lymph, chyle and milk. Microscopic study of the carbohydrates in vegetable and animal forms; of the physiologic emulsions of fat; of the crystalline waste products; and of the physiologic conditions of the blood-cells and the process of fibrin formation. Practical instruction is given during this course in the enumeration of the blood cells, in the estimation of hæmoglobin and of the corpuscles in mass, in the spectroscopic examination of the blood and in the use of the polariscope. Nine hours a week, first semester, second year. This does not represent the actual number of hours of work done by each student, since, during a part of the session, the class is divided into sections for practical exercises. Open to those who have completed courses i and ii. PROFESSOR BEARD AND DRS. WILCOX AND FLIGMAN.

Course V. Experimental physiology.

Laboratory work and demonstrations. A study of physiologic apparatus, electrical stimuli and methods of experimentation; the demonstration of experiments which illustrate physiologic function in the muscular, nervous, vascular, respiratory and glandular systems. Three hours a week, second semester, second year. Open to those who have completed course iv. PROF. BEARD AND DR. WILCOX.

Course VI. Practical dietetics. (Elective.)

Lectures and laboratory exercises. A study of food analysis, food preparation and of the general principles of food selection, including a discussion of invalid and infant dietary. Two hours a week, first semester, fourth year.

PROFESSOR BEARD AND MISS WILKINSON.

Opportunity will be afforded, in the laboratories of physiology and physiologic chemistry, for the pursuit of special courses of study, in both experimental and chemical physiology, under the direction of the chair.

Full courses in animal biology in the college of science, literature and the arts will be accepted in lieu of first year physiology in the department of medicine.

See statement of fees, page 18.

CHEMISTRY.

The work in this subfect is carried on in a building especially arranged for this work. The qualitative laboratory has a floor space of about 2300 square feet and accomodates 100 students at a time. It is used for instruction in general chemistry and analysis. It is well supplied with the usual apparatus. The quantitative laboratory has a floor space of about 1500 feet, and accomodates 68 students at one time. It is used for instruction in the analvsis of the urine, quantative analysis and organic chemistry.

Course I. General inorganic chemistry, including qualitative analysis.

Lectures and recitations. 3 hours a week, first semester; 2 hours a week, second semester, first year. PROFESSOR BELL.

Laboratory work; qualitative analysis. 6 hours a week, first year, from October 1st to May 8th. PROFESSORS BELL AND CAREL.

Course II. Analysis of the urine; toxicology: chemistry of carbon compounds.

Lectures and recitations. 1 hour a week, first semester; 2 hours a week, second semester, second year. PROFESSOR BELL.

Laboratory work; analysis of the urine. 6 hours a week, second year, from October 1st to January 1st. PROFESSORS BELL AND CAREL.

Courses I, II and III in chemistry, in the school of technical and applied chemistry, are accepted in place of first year chemistry in the department of medicine.

See statement of fees, page 18.

An optional course in experimental work is given during the second semester of the second year.

It includes work in toxicology, water analysis, food analysis, and the preparation of carbon compounds, according to the wishes and needs of the individual student.

No charge is made except for apparatus destroyed.

MATERIA MEDICA AND THERAPEUTICS.

The work in materia medica and therapeutics is graded to cover a period of three years. It consists of lectures, recitations and demonstrations, conducted in the laboratory of materia medica. This laboratory is in Medical Hall. It is supplied with crude drugs and botanical specimens. Samples of these the student is allowed to retain for private study. Pharmaceutical preparations are also placed before him and he is taught the method of their manufacture and their most eligible forms.

Course I. Pharmacology.

This course includes the study of the general characteristics of drugs and of their physiologic actions. Lectures, recitations and laboratory work. 3 hours a week, second year. PROFESSOR BRACKEN.

Course II. Therapeutics.

In this course drugs are studied in groups, as governed by their physiologic action, and the therapeutic features of such groups are described. Other remedial measures than those depending upon drugs, such as hydro-therapy, serum-therapy, dietetics. etc., are fully considered. Lectures and recitations. 2 hours a week, third year. PROFESSOR BRACKEN.

Course III. Therapeutics, elective.

In this course the treatment of individual diseases is studied and the application of therapeutic agents to them is discussed. Clinical instruction in therapeutics, conducted at St. Barnabas and Asbury hospitals, is added to the work of the classroom. Lectures and clinics. 2 hours a week, fourth year. PROFESSOR BRACKEN.

PATHOLOGY AND BACTERIOLOGY.

The laboratories of pathology and bacteriology occupy spacious quarters in the laboratory of medical sciences. A general laboratory, 44x70 feet, is well lighted by windows on three sides and part of the fourth. Electric light for microscopic and general illuminating purposes is also provided. The arrangement is such that four students are grouped so as to have a sink, with gas and electric light, distilled and city water and waste connection, and ample desk space next the windows. Eight lockers, arranged beneath the table and on the walls, provide for apparatus, microscopes, etc., and are given at the beginning of the course to each student. Immediately behind and accessible to each student, are sterilizers, incubators, blow-pipes, etc. Cupboards, drawers, a large incubator, sinks, fume chambers, demonstration and distribution tables, complete the arrangement of the room.

Two private rooms of the demonstrators flank it on either side. Adjoining one of these are the department library and the office and private laboratory of the professor of pathology and bacteriology. Adjoining this is the private laboratory of the professor of surgical and clinical pathology. Specimens illustrative of surgical pathology are here prepared and diagnostic work done.

In the basement of the building, the department has store rooms and a room where pathological animals are housed. Here too are equipped laboratories for research in bacteriology and experimental pathology, as well as a room in which all the culture media are made.

In the third story, immediately above and of the same size as the large laboratory, is a museum for the storage and exhibition of pathological specimens, while a preparation room for their reception and assorting adjoins it.

The hospitals of Minneapolis and St. Paul afford a large supply of material and frequent opportunities for post-mortem examinations.

MICROSCOPES.

An adequate equipment of microscopes with attachments, immersion lenses, etc., permits of the rental of an instrument to each student, at a cost of $2.00 per semester, whenever he is unprovided with one suitable for his purposes.

Course I. (a) Bacteriology.

Lectures and demonstrations. This subject will be treated not only from the aspect of pathology, but in its relation to hygiene and public health. The general scope of bacteriology, the classification of the various bacterial forms, the composition and manufacture of culture media, the methods of isolation and culture, the testing of various bactericidal materials, conditions, etc., will be studied until a thorough knowledge of technique is acquired, (so far as may be possible with nonpathogenic bacteria). The special study and comparison of the various pathogenic micro-organisms will then be systematically taken up. 2 hours per week, first semester, third year.

PROFESSORS WESBROOK AND WHITE AND DR. WILSON.

(*b*) *Bacteriology.* Laboratory work, teaching the general principles of and familiarization with the making of culture media, the methods of culture isolation and the microscopic examination of stained and living bacteria, the testing of various antiseptics, etc.

The student will be required to cultivate in the various media, for macroscopic and microscopic examination, all the important pathogenic bacteria, such as the pyogenic bacteria, B. anthracis, B. typhi abdominalis, B. coli communis, Vibro choleræ, B. diphtheriae, B. tuberculosis, etc. Materials and tissues from men and animals, containing these and other bacteria, will be provided for diagnosis and the isolation of the bacteria in pure culture, where practicable. Parallel study of micro-organisms which might be mistaken for these, will also be pursued. Bacteriological diagnosis, in its relation to clinical diagnosis and public health, will be especially dwelt upon. 9 hours a week, for the first twelve weeks of the first semester, third year. PROFESSORS WESBROOK AND WHITE AND DR. WILSON.

Course II. (*a*) *General pathology.*

Lectures, demonstrations and laboratory work on the general processes involved in disease. Bacteriology and its etiological relation is taught concurrently (see above). The general considerations of tumors will be omitted, since it is fully dealt with in the course on surgical pathology and special pathology. 2 hours a week, first semester, third year.

(*b*) *General pathology.*

Laboratory work, particularly on the history of inflammation, (largely experimental) degenerations, etc. Nine hours a week for four weeks at the end of the first semester, third year. PROFESSORS WESBROOK AND WHITE AND DR. WILSON.

Course III. (*a*) *Special pathology.*

Lectures and demonstrations. The special study of the pathological processes occurring in the blood, vascular and lymphatic systems, lungs, liver, kidneys, alimentary canal, etc., will be taught by the demonstrations of fresh tissues and preserved specimens from the pathological museum. Three hours a week, second semester, third year. PROFESSORS WESBROOK AND WHITE.

(*b*) *Special pathology.* Practical laboratory work, in which the students will be required to mount and examine, under the microscope, selected, fresh and stained specimens of morbid tissues, fluids, etc. The microscopic and chemical study of such materials as pathological blood, sputum, urine, contents of alimentary canal, etc., and the application of laboratory methods to clinical diagnosis will form an important part of this work and will be taken up at the completion of the study of the morbid condition in each organ or system. The animal parasites will also receive attention. The histology of the various tumors will be fully given and students will be provided with specimens for staining, mounting and examination. Nine hours a week, second semester, third year.

PROFESSORS WESBROOK AND WHITE, DRS. HEAD AND WILSON.

(*c*) *Special pathology.* Autopsies and post-mortem technique. Students will have an opportunity of personally taking part in this work, under the direction of the pathologist in charge, in the hospitals of Minneapolis and St. Paul. A knowledge of the technique of post-mortem work and of morbid anatomy will be thus afforded. Throughout the third and fourth years.

PROFESSOR WHITE AND DR. ROTHROCK.

Course IV. Surgical pathology.

(See principles of surgery). This course will consist of lectures and laboratory demonstrations and will cover the general subject of the pathological and bacteriological basis of surgery. The lectures will be illustrated by charts and diagrams, by fresh and preserved specimens and, so far as practicable, demonstrations will be given of the various processes and of the bacteria concerned. Especial attention will be given to inflammation and its complications, to the infectious diseases of surgical importance and to tumors. 2 hours a week, first semester, third year, and 2 hours a week, second semester, fourth year. PROFESSOR STEWART.

PRACTICE OF MEDICINE.

The course in the principles and practice of medicine is graded in the third and fourth years. Examinations are held at the close of each of these years. The lectures and recitations are conducted by several members of the teaching staff and the dispensary and bedside clinics by a large corps of instructors.

Course I. Infectious diseases and the phenomena of injection.
Parasites; intoxicants; ptomaines. Lectures and recitations. 1 hour a week, third year. PROFESSOR HUNTER.

Course II. Local diseases; the thoracic viscera; heart; lungs and blood vessels. Lectures and recitations. One hour a week, third year. PROFESSOR ABBOTT.

Courses III. Elementary case-taking. Four lectures and recitations. First semester, third year. PROFESSOR GREENE.

Course IV. Contagious and infectious diseases; nutritive results of infection; the relations of temperament and diathesis, the laws of heredity; medical statistics; the principles of nursing, and a minute study of the literature of the topics taken up. Lectures and recitations. One hour a week, fourth year. PROFESSOR HUNTER.

Course V. Diseases of nutrition. in general and in detail, including hæmatology, diabetes, rheumatism, gout, scurvy, lithœmia, Graves' and Hodgkins' diseases, etc. Lectures and recitations. One hour a week, fourth year. PROFESSOR GREENE.

Course VI. Diseases of the abdominal viscera; stomach; intestines, liver; kidneys; disorders of digestion; infant feeding and gastro-intestinal diseases in childhood; diseases of old age. Lectures and recitations. One hour a week, fourth year. PROFESSOR ABBOTT.

Course VII. Case-taking and examinations for life insurance. (*elective.*) Lectures and recitations. Two hours a week, for nine weeks, second semester, fourth year. PROFESSOR GREENE.

Course VIII. Clinical exercises in general medicine, consisting of clinical instruction to sections of the third and fourth year classes, in the dispensaries, by the bedside and in the amphitheatres of the several hospitals of St. Paul and Minneapolis, as follows:

(*a*) City Hospital, Minneapolis, two hours a week, both years. Professors J. W. Bell and H. L. Staples and C. Nothnagel.

(*b*) St. Barnabas' Hospital, Minneapolis, two hours a week, both years. Professor C H. Hunter and Dr. Geo. D. Head.

c) Asbury Hospital, Minneapolis, two hours a week, second semester, both years Professors J. W. Bell and C. Nothnagel.

(*d*) City and County Hospital, St. Paul; St. Joseph's Hospital and St. Luke's Hospital, St. Paul, three hours a week, both years. Professor E. J. Abbott.

(*e*) City and County Hospital, St. Paul, two hours a week, both years. Professor C. L. Greene and Drs. Senkler and Henderson.

(*f*) Free Dispensary, St. Paul, two hours a week, both years. Professor C. L. Greene and Drs. Senkler, Lando and Ramsey.

(*d*) University Free Dispensary, Minneapolis, four hours a week, both years. Professor H. L. Staples, Drs. L. A. Nippert and Dr. R. E. Cutts.

PHYSICAL DIAGNOSIS.

Course I. The thorax: its topography, methods of examination, applied to the normal and abnormal chest; diseases of the respiratory organs; their physical signs and differential diagnosis. PROFESSOR J. W. BELL.

Course II. The precordial region: its topography, methods of examination, applied to the normal and abnormal heart; diseases of circulatory organs; their physical signs and differential diagnosis. PROFESSOR J. W. BELL.

Course III. The abdomen: its topography, methods of examination under normal and abnormal conditions; diseases of this region; their physical signs and differential diagnosis. Lectures and recitations. One hour a week, third year.
PROFESSOR J. W. BELL.

Course IV. Clinical physical diagnosis.

Practical clinical instruction given to small sections of the classes. For this purpose the clinical material of the several hospitals and dispensaries in Minneapolis is utilized. Three hours a week, third year. PROFESSOR NOTHNAGEL.

Course V. Clinical physical diagnosis.

Practical clinical instruction given to small sections of the classes. For this purpose the clinical material of the several hospitals and dispensaries in Minneapolis is utilized. Two hours a week, both semesters, fourth year. PROFESSOR J. W. BELL.

Course VI. Clinical physical diagnosis, continued.

The clinical material of the hospitals and dispensaries of the city of St. Paul is utilized in the form of clinics. Two hours a week, fourth year.
PROFESSOR GREENE AND DR. G. E. SENKLER.

SURGERY.

The course in surgery is graded in the third and fourth years. Examinations are held at the close of each of these years. Lectures and recitations are given by the teaching staff in surgery and clinics at the dispensaries and hospitals of Minneapolis and St. Paul by a large corps of instructors.

Course I. The principles of surgery.

Inflammation; traumatic fevers; suppurations; acute inflammations of joints; ulceration; gangrene; thrombosis and embolism; septicœmia; pyæmia; erysipelas; tetanus; surgical tuberculosis; actineomycosis, anthrax and glanders. Lectures and recitations, two hours a week, first semester, third year. PROFESSOR STEWART.

Course II. Operative Surgery.

Lectures upon the principles of operative procedures; the preparation of patient, operator and operating rooms; the principles of asepsis, antisepsis and sterilization; anæsthesia and anæsthetics; hæmostasis, ligatures and sutures; dressings, bandages and the treatment of wounds. One hour a week, first semester, third year. PROFESSOR DUNSMOOR.

Course III. The practice of surgery.

Fractures and dislocations; injuries of joints; injuries and surgical diseases of the skin; of the lymphatics, blood vessels and nerves; of the tendons, fasciæ and bursæ; of the face, mouth, tongue, jaws, excepting the study of tumors and plastic surgery. Lectures and recitations. Two hours a week, second semester, third year. PROFESSOR DUNN.

Course IV. Practice of surgery.

Surgery of the head, neck, chest, back, breast, abdomen, including hernia, anus, rectum and urinary tract. Lectures and recitations. Two hours a week, first semester, fourth year. PROFESSOR DUNN.

Course V. Operative surgery.

An elective laboratory work, consisting of operations, performed by sections of the class, under the supervision of the instructors, upon the cadaver and upon animals. Three hours a week, first half of first semester, fourth year.
PROFESSOR DUNSMOOR AND DR. LAW

Course VI. Orthopedic surgery; including diseases of bones, joints, synoviæ and bursæ, congenital and acquired deformities: dystrophies, with the principles of treatment. Lectures and recitations. Two hours a week, eight weeks, last semester, fourth year. PROFESSOR GILLETTE

Course VII. Surgical pathology: Tumors.

A special course upon tumors, taking up the general pathology and the general principles of the treatment of tumors. Each variety of tumor is then discussed, together with its histology, life-history, diagnosis and treatment. The course is illustrated by charts and museum specimens. Lectures and recitations, two hours a week, second semester, fourth year. PROFESSOR STEWART

Course VIII. Bandaging and dressings.

A practical course of instruction, by means of demonstrations and drill, under the supervision of the chair of operative surgery. Two hours a week for eight weeks, first semester, fourth year. PROFESSOR DUNSMOOR AND DR. LAW

Course IX. Clinical surgery.

Courses of clinics at which operations, in the whole domain of surgery, are witnessed by the students of the third and fourth years. These clinics are held in the dispensaries and hospitals of the cities of Minneapolis and St. Paul, upon Thursdays and Saturdays throughout the year. The classes alternate at the two cities in their attendance upon these clinics. They are conducted as follows:

At the City and County Hospital, St Joseph's Hospital, or St. Luke's Hospital, in St. Paul, weekly, by Professor C. A. Wheaton.

At the City and County Hospital, St. Joseph's Hospital, St. Luke's Hospital, or Free Dispensary, at St. Paul, with sections of the class weekly. by Dr. John T. Rogers, Dr. G. M. Coon and Professor A. J. Gillette.

At the City and County Hospital, or at St. Joseph's Hospital, or at St. Luke's Hospital, St. Paul, weekly, by Professor Justus Ohage.
At the Asbury Hospital, or the City Hospital, Minneapolis, weekly, by Professor F. A. Dunsmoor.
At St. Mary's Hospital, or the City Hospital, Minneapolis, weekly, by Professor J. H. Dunn.

At St. Barnabas' Hospital, or the City Hospital, Minneapolis, weekly, by Professor J. E. Moore. At the University Free Dispensary, by Drs. Dunsmoor, Law, Stewart, Mann and Davis.

OBSTETRICS.

The subject of obstetrics is taught by lectures, recitations and demonstrations upon th manikin: by illustrative drawings and by attendance upon cases of labor. The didacti work is done in the third year; the clinical study is had in the fourth year. The entire obstetric service of the City Hospital in St. Paul and a large part of the service of the Minneapolis City Hospital are at the disposal of the chair of obstetrics. Clinics are also held a other hospitals in St. Paul and Minneapolis.

Course I. The anatomy and physiology of the pelvic organs; the development of the embryo and appendages: pregnancy; symptoms and diseases; abortion; operative obstetrics: the complications of labor and its sequelae. Lectures and recitations. 2 hours a week until November 1st and from January 1st to the end of the year, third year. PROFESSOR CATES

Course II. The theory and practice of obstetrics.
The mechanism and conduct of normal labor; operative obstetrics; the complications of labor and its sequelae. Lectures and recitations. 2 hours a week during November and December, third year. PROFESSOR RITCHIE.

Course III. Course of demonstrations, by charts and upon the manikin, associated with the course lectures.

Course IV Clinical obstetrics. The study of and participation in two or more deliveries, in the fourth year, under the personal direction of Professors Ritchie and Cates, Drs. H. W. Davis and Frederick Leavitt.

GYNECOLOGY.

The course in the diseases of women consists of lectures, recitations, clinical instruction and the witness of operations, upon the human subject, as they may offer,

Course I. Lectures and recitations.
Two hours a week, first semester, fourth year. PROFESSOR STONE.

Course II. Clinical course.
Observations and examinations of patients, methods of examination, diagnosis and treatment. Two operations at least, weekly, at which the student is required to assist. PROFESSORS A. W. ABBOTT AND A. MCLAREN.

Instruction is given at the University and St. Paul Free Dispensaries in methods of examination, diagnosis, use of instruments, etc.

OPHTHALMOLOGY AND OTOLOGY.

Course I. Diseases of the eye and its appendages.
Lectures and recitations. 1 hour a week, 16 weeks, fourth year.
PROFESSOR TODD.

Course II. Refraction and its errors. Diseases of the ear.
Lectures and recitations. 1 hour a week, 16 weeks, fourth year.
PROFESSOR FULTON.

Course III. Clinical lectures will be given and operations performed at St. Joseph's Hospital, St. Paul, every Saturday. Fourth year.

Clinical lectures will be given every Wednesday at the St. Paul City Hospital during the months of January, February and March, and occasionally clinics will be given at St. Luke's Hospital. Fourth year. PROFESSOR FULTON.

Course IV. Clinical lectures will be given and operations performed at Asbury Hospital, Minneapolis, every Thursday. Fourth year. PROFESSOR TODD.

Clinics will be given at the Minneapolis City Hospital occasionally during October, November, December and January. Fourth year. PROFESSOR TODD.

Course V. Clinical instruction will be given at the University Free Dispensary in the diagnosis of diseases of the eye and ear; in the methods of examination; in the use of instruments, including the ophthalmoscope, and in the application of remedies, etc. Fourth year. PROFESSORS FULTON AND TODD.

Other free dispensaries in St. Paul and Minneapolis are open daily in this branch, where students have the privilege of attendance.

NERVOUS AND MENTAL DISEASES.

The required courses of lectures and recitations in this department will be given in the fourth year. Instruction will be by recitations and the "case method." Elective courses in clinical neurology, psychiatry, medical electricity and neuropathology will be offered in the fourth year.

Course I. Neurology.

Lectures, recitations and demonstrations. 2 hours a week, 12 weeks, first semester, fourth year. PROFESSORS RIGGS AND JONES (Alternating.)

Course II. Psychiatry.

Lectures, recitations and demonstrations. 2 hours a week, 5 weeks, second semeseer, fourth year. PROFESSORS RIGGS AND JONES (Alternating.)

Course III. Electro-therapeutics, (elective.)

Fourth year. DR. A. W. DUNNING.

Course IV. Clinical neurology and psychiatry.

Fourth year. PROFESSORS RIGGS AND JONES.

Practical instruction will be given upon Thursdays and Saturdays, fourth year. Clinics will be conducted in St. Paul, by Professor Riggs, at the City and County Hospital, St. Luke's Hospital, St. Joseph's Hospital and the Free Dispensary; and at Minneapolis by Professor Jones, at the City Hospital, Asbury Hospital, St. Mary's Hospital and the University Free Dispensary.

Course V. Laboratory course, (elective.)

Fourth year. DR. L. B. WILSON.

DISEASES OF THE SKIN.

This subject is taught by lectures, recitations and clinical demonstrations.

Course I. The anatomy and physiology of the skin. Diseases of the skin and its appendages; venereal diseases. Two hours a week, second semester, fourth year. PROFESSOR VANDER HORCK.

Course II. Clinical lectures, in connection with the dispensaries and hospitals of Minneapolis and St. Paul. Weekly in the fourth year. PROFESSORS VANDER HORCK AND BURNSIDE FOSTER.

DISEASES OF THE NOSE AND THROAT.

Course I. Anatomy and physiology of the nose and throat; pathology. diagnosis and treatment.

Lectures and recitations. Two hours a week, eight weeks, fourth year. PROFESSOR LATON.

Course II. Clinical instruction, given at the University Free Dispensary, in the diagnosis of diseases of the nose and throat; in the methods of examination; in the use of instruments, and in the application of remedies, etc. Five hours a week, both semesters, fourth year. PROFESSOR LATON.

Course III. Clinical instruction, given at the St. Paul Free dispensary, in the diagnosis of diseases of the nose and throat; in the methods of examination; in the practical use of instruments and application of remedies; and in the *applied anatomy* of the nose and throat, illustrated by *dry* and *wet* preparations. Two hours a week. PROFESSOR SCHADLE.

DISEASES OF CHILDREN.

Course I. Didactic lectures, arranged to cover, so far as possible, the general subject of pediatrics. A course, consisting of one lecture a week throughout the fourth year, beginning with a consideration of the special characteristics of the normal infant and child as distinguished from the adult and passing on to a detailed description of the features and management of the diseases peculiar to infancy and childhood and of the more or less specialized forms in which certain diseases common to all ages exist during the early years of life. These lectures will be suitably illustrated by charts, colored plates, specimens, and the occasional use of the stereopticon. PROFESSOR T. S. ROBERTS.

Course II. An auxiliary course of lectures will be given in this branch. to the students of the fourth year, at special hours to be announced in the future. PROFESSOR J. T. CHRISTISON.

Course III. Clinical instruction will be given at the St. Paul Free Dispensary and the St. Paul City Hospital four hours weekly throughout the fourth year.

Professor J. T. Christison.

Course III. Clinical instruction will be given in Minneapolis at Barnabas' Hospital, the Children's Home, the University Free Dispensary and other specially designated places at such times as opportunity presents Fourth year.

Professor T. S. Roberts.

HYGIENE.

A course of lectures in hygiene is conducted by a corps of the faculty. The general subject is thus divided into several branches, namely: chemistry of air, water and soil; the physiology of foods, beverages, clothing, bathing and exercise; public sanitation (including sewage and garbage disposal, applied and school disinfection, regulations of quarantine, the disposal of the dead, the devolopment of vital statistics, the care of slaughter houses, etc.,) the bacterial diagnosis of infectious diseases, and some practical phases of sanitary engineering. The examinations in this branch are conducted by the lecturers jointly. The course includes twenty lectures and recitations, which are given during the second semester of the fourth year. Ppofessors Bell, Beard, Wesbrook and Bracken.

MEDICAL JURISPRUDENCE.

An elective course of lectures and recitations, in the legal relations of medicine. Two hours a week, for eight weeks, fourth year. Professor Sweeney.

THE HISTORY OF MEDICINE.

An elective course of lectures is given in the history of medicine and of the medical profession from the earliest times, including accounts of the epoch-making discoveries in medicine, brief sketches of the lives of eminent physicians and an account of the great plagues of history. Two hours a week, for eight weeks, fourth year. Professor Burnside Foster.

MECHANO-THERAPY.

Courses of illustrated lecturers and clinical demonstrations in gymnastics and massage, dealing with the physiology of technique and therapeutics. The physiology, therapeutics and technique of hydro-therapy are also discussed. One hour a week, for twelve weeks, second semester, fourth year. Dr. Haldor Sneve.

TEXT-BOOKS AND COLLATERAL READING.

The following text-books are preferred by the faculty. Reference works are suggested, also, for collateral reading:

Medical dictionaries;

Gould's Medical Dictionary.
Dunglison's Medical Dictionary.
Duane's Medical Dictionary.
Dorland's Medical Dictionary

Histology.

First year—
  Wilson's The Cell.
  Piersol's Histology
  Böhm-Davidoff-Huber's Histology.
  Stöhrs Histology.
  Quain's Anatomy, 10th Ed. Vol. I, Pt. II.
  Schæfer's Histology.
  Parker's Biology.

Second year.
  Piersol's Histology.
  Quain's Anatomy, Vol. III, Pts. I, III and IV.
Collateral reading—Kölliker's Gewebelehre Pts. I and II; Duval's Précis d' Histologie;

Ranvier's Traite d' Histologie; Weyesse's Histology; Behren's Kossel u Schieffer-decker's Gewebelehre; Klein's Histology; O. Hertwig's The Cell; Lee's Microtomist's Vade Mecum: Stirling's Practical Histology; Willey's Amphioxus, etc.; Thompson's Zoology; Huxley & Martin's Biology; Davenport's Experimental Morphology; Barker's Nervous System.

Embryology.

Minot's Embryology.
Hertwig-Mark's Embryology.
Marshall's Vertebrate Embryology.

Collateral reading—Koliker's Enllwicklungsgeschichte; Prenant's Embryologie; Schenk's Embryologie; O. Schultze's Embryologie; Heisler's Embryology.

Anatomy.

First year—
Morris'. Text-book of Human Anatomy.
Quain's Anatomy, 10th edition, Vol. II, Pts. I and II.
Gray's Descriptive and Surgical Anatomy.
Gerrish's Anatomy.

Second and third years--
Quain's Anatomy, 10th edition.
Morris' Text-Book of Anatomy.
Gerrish's Anatomy.
Gray's Anatomy.
Spatschaltz' Atlas of Human Anatomy.
Holden's Practical Anatomy.
Erdmann's Manual of Dissections of the Human Body.
Weiss' Practical Anatomy.
Hayne's Manual of Anatomy.
Owen's Manual of Anatomy.
Treve's Applied Anatomy.

Collateral reading—Flower's Osteology of Mammals; Gegenbauer's Elements of Comparative Anatomy; Chauveau's Comparative Anatomy; Wiedersheim's Elements of Comparative Anatomy; McClellan's Regional Anatomy; Meynert's Psychiatry. Part I: anatomy, physiology and chemistry of the brain; Deaver's Surgical Anatomy; Edinger's Anatomy of the Nervous System; Hildebrand's Chirurgisch Topographise Anatomie.

Physiology.

First and second years—
Foster's Physiology, sixth edition.
Howell's American Text-Book of Physiology.
Stirling's Practical Physiology.
Waller's Human Physiology.

Collateral reading—Landois and Stirling's Handbook of Physiology; Chapman's Phyiology; Stewart's Practical Physiology; Yeo's Physiology; Blyth's Foods.

Chemistry.

Second year.
Tyson's Examination of Urine.
Reese's Toxicology.

Materia medica and therapeutics.

Bracken's Outlines of Materia Medica and Pharmacology.

Collateral reading—The Pharmacopeia of the U. S.; The National Dispensary: Sayre's Organic Materia Medica and Pharmacognosy; Culbreth's Materia Medica and Pharmacology; Foster's Practical Therapeutics; Hare's System of Practical Therapeutics; Allen's Handbook of Local Therapeutics; Thompson's Practical Dietetics.

Pathology.

Ziegler's General and Special Pathology.
Stengel's Text-book of Pathology.
Coat's Manual of Pathology.
Mallory and Wright's Pathological Technique.
Collateral reading—Hamilton's Text-Book of Pathology; Delafield and Pruddens' Hand-book of Pathological Anatomy and Histology; Woodhead's Practical Pathology von Kahlden's Pathological Histology; Thoma's Text-Book of General Pathology; Lubarsch Ostertag, Ergebnisse der Pathologie u Anatomie, Orth, Pathologische Anatomie; Birch-Hirschfield, Pathologische Anatomie; Clifford Albutt's System of Medicine, Vol. I: Leukhart's die Thierische Parasiten des Menschen. Bouchard, Traite de Pathologie Generale; Eichorst, Pathologie u Therapie; Barlow's General Pathology.

Surgical Pathology.

Tillman's Principles of Surgery and Surgical Pathology.
Collateral reading—Park's Surgery, Vol. 1; Warren's Surgical Pathology; Senn on Tumors; Bowlby's Surgical Pathology; Nancrede's Lectures upon the Principles of Surgery; Watson Cheyne's Tuberculosis of Bones and Joints.

Clinical Microscopy.

Von Jaksch's Clinical Diagnosis.
Simon's Clinical Diagnosis.
Cabot's Clinical Examination of the Blood.
Cabot's Serum Diagnosis of Disease.
Collateral reading—Lenhartz Mikroscopie u Chemie am Krankenbett: von Limbeck Klinische Pathologie der Blutes; Rieder's Atlas der Mikroskopie des Harnes.

Bacteriology.

Muir and Richie's Manual of Bacteriology.
Abbott's Principles of Bacteriology.
Abbott, The Hygiene of Transmissible Diseases.
Park, Bacteriology in Medicine and Surgery.
Collateral reading—Sternberg's Manual of Bacteriology; Fraenkel's Bacteriology; Woodhead's Bacteria and their products; Duflocq, Lecons sur les Bacteries Pathogenes; Flügge, die Mikroorganismen; Lehmann and Neumann, Atlas u Grunnriss d, Bakteriologue u Lehrbuch d, spec. Bakt, Diagnostik; Migula, System de Bakterien; Duclaux, Traite de Microbiologie. Hueppe (Jordan) Principles of Bacteriology; Nory, Laboratory Work in Bacteriology

Practice of Medicine.

Osler's Practice of Medicine.
Collateral reading—Allbutt's System of Medicine; Eichhorst's Internal Medicine. The College Library; Thompson's Practice of Medicine.

Case-taking and Life Insurance.

Greene: The Examination for Life Insurance and its Associated Clinical Methods.

Physical Diagnosis.

Flint's Auscultation and Percussion.
Musser's Medical Diagnosis.
Vierordt's Medical Diagnosis.
Collateral reading—Bramwell's Heart and Thoracic Aorta; Fox on the Lungs; Sansom's Heart and Aorta; Roger's Introduction to the Study of Medicine.

Surgery.

Park's Surgery.
Tillman's Principles of Surgery and Surgical Pathology.
Kocher's Operative Surgery.
Warren's Surgical Pathology and Therapeutics.
Senn's Principles of Surgery.

American Text-Book of Surgery.
Jacobson's or Zuckerkandl's Operative Surgery.
Robert's Modern Surgery.
Wharton and Curtiss' Practice of Surgery.

Collateral reading—International Text-Book of Surgery; Agnew's Practice of Surgery; Dennis' Practice of Surgery; Stimson's Fractures and Dislocations; Hamilton's Fractures and Dislocations.

Genito-urinary diseases.

Thomson's Diseases of Urinary Organs.

Collateral reading—Van Buren and Keys' Venereal Diseases; Bumstead and Taylor's Venereal Diseases.

Orthopaedia.

Moore's Orthopædic Surgery.
Bradford's and Lovett's Orthopædic Surgery.

Obstetrics.

Lusk, Hirst, Davis, Jewett and the American Text-Book of Obstetrics.

Gynecology.

Dudley's Diseases of Women.
Garrigue's Diseases of Women.
Byford's Diseases of Women.

Collateral reading—American System of Gynecology; Emmett's Diseases of Women; Thomas' and Munde's Gynecology.

Ophthalmology and Otology.

American Text-Book of Diseases of the Eye, Ear, Nose and Throat.
May's Diseases of the Eye.
De Schwienitz' Diseases of the Eye.
Swanzy's Diseases of the Eye.
Dench's Diseases of the Ear.
Politzer's Diseases of the Ear.

Collateral reading—Berry's Diseases of the Eye; Fuch's Diseases of the Eye; Howell's Diseases of the Ear and Naso-Pharynx; Norris and Oliver's Ophthalmology; Noyes' Diseases of the Eye.

Nervous and Mental Diseases.

Dana's Nervous Diseases.
Church and Peterson's Nervous and Mental Diseases.
Berkeley's Mental Diseases.

Collateral reading—Clouston's Lectures on Mental Diseases; Collin's Treatment of Nervous Diseases; Edinger's Anatomy of the Central Nervous System; Gordinier's. Anatomy of the Central Nervous System; Collin's Aphasia: Mills' Nervous Diseases.

Diseases of Children.

Rotch's Pediatrics.
Holt's Diseases of Children.
American Text-Book of Diseases of Children.

Collateral reading—Osler's Practice of Medicine; Keating's Cyclopaedia of Diseases of Children.

Diseases of skin.

Hyde's Diseases of the Skin.
Jackson's Diseases of the Skin.
Taylor's Venereal Diseases.

Collateral reading—Crocker's Diseases of Skin; Morris' Diseases of the Skin; Hayden's Diseases of the Skin; Lydston's Genito-Urinary, Venereal and Sexual Diseases.

Diseases of Nose and Throat.

Shurley's Diseases of the Nose and Throat.
Ingall's Diseases of the Nose, Throat and Lungs.
Kyle's Diseases of the Nose and Throat.
Coakley's Diseases of the Nose and Throat.

Hygiene.

Coplin and Bevan's Practical Hygiene.
Park's Hygiene.

Collateral reading—Richardson's Preventive Medicine; Buck's Hygiene and Public Health.

Medical jurisprudence.

Taylor's Medical Jurisprudence.

Collateral reading—Hamilton's American System of Legal Medicine; Withaus' Principles of Forensic Medicine and Toxicology; Wharton and Stille's Medical Jurisprudence.

DEGREES.

The degree of doctor of medicine is conferred by the Board of Regents upon students who are recommended, by vote of the faculty, for graduation. Candidates for the degree must possess the following essential qualifications:

(1) Twenty-one years of age and upwards.

(2) Good moral character.

(3) A degree of preliminary education equivalent to that demanded by the examination for entrance to this college.

(4) Four full college years spent in the study of medicine; the fourth year, at least, in this University, and the remainder in this or other recognized colleges of medicine.

(5) Satisfactory examinations passed in all branches in accordance with the foregoing rules.

DISPENSARY AND HOSPITAL CLINICS.

DISPENSARIES.

The University free dispensary is located in the new clinical building. Several rooms are devoted to the reception of patients and to their examination and treatment. Its service is a growing one and is utilized for the teaching of the classes of the third and fourth years. The faculty and a corps of assistants manage the dispensary. Dispensaries at Asbury Hospital and the City Hospital are also open to the students of the University. They are largely attended by members of the faculty.

The St. Paul Free Dispensary is centrally situated and offers its clinics to the students of this college. It owns the building formerly used by the St. Paul Medical College—a twenty-room building, which has been equipped for its occupancy. It centralizes the clinical opportunities of St. Paul and its staff is, similarly, made up largely of faculty members.

HOSPITALS.

The hospitals of the cities of Minneapolis and St. Paul have very generously opened their doors to the students of this department. Saturday and Thursday mornings and afternoons, throughout the year, are devoted to the use of these clinical opportunities by the junior and senior classes. These classes alternate in periods of six weeks between the two cities upon the days mentioned.

THE CITY HOSPITAL, of Minneapolis, occupies spacious buildings and affords a large mass of clinical material which members of the faculty upon its staff are permitted to utilize during their terms of service.

ST. MARY'S HOSPITAL has a staff upon which this faculty is represented by four members. Its management has seconded the efforts of the staff to make the hospital useful to medical students by providing an amphitheatre of modern construction, in which seventy-five spectators can be accommodated. The hospital also opens its wards for the bedside study of disease. Surgical and medical clinics are held here upon the weekly clinic days.

St. Barnabas' Hospital has also generously equipped an amphitheatre, within which a class of fifty students can be gathered. Bedside instruction is given freely in its wards to the students of this college. Clinics are usually conducted in this amphitheatre on Saturdays. Its staff, also, numbers upon it six members of this faculty.

Asbury Methodist Hospital offers its clinical opportunities to the college. Wednesday and Saturday clinics are held in its wards and amphitheatre. Its service is, in part, manned by faculty members.

The City and County Hospital, of St. Paul, occupies a large building, of modern construction and generously equipped with clinical conveniences. Its management has spared neither effort nor means to make it a model of its class. It contains a large amphitheatre for teaching purposes. It enters some two thousand patients annually, a large proportion of whom are of the emergency order or suffer from acute forms of disease. This college is represented upon its staff by a majority of. the members.

St. Joseph's Hospital has always contributed generously to the clinical advantages of the University. It contains a spacious amphitheatre, built and equipped for the students of this college. It has faculty members upon its staff who conduct weekly clinics in the hospital. Its service is large, its capacity being upwards of one hundred beds.

St. Luke's Hospital possesses all the most desirable features of modern hospital architecture and has a large clinical service. It is furnished with an amphitheatre for the benefit of students and has a thoroughly equipped operating room, in which clinics are frequently conducted.

MINNEAPOLIS CLINICS.
1901-1902.

THURSDAY.

9-10:30	Medicine	Prof. Bell	½ Class.	City Hospital.
10:30-12	Medicine	Prof. Nothnagel	½ Class.	City Hospital.
9-11	Gynecology	Prof. Abbott	½ Class.	St. Barn. and City Hos.
11:12	Eye and Ear	Prof. Todd	½ Class.	Asbury Hospital.

NOON RECESS.

1-2	Laryngology	Prof. Laton	Sections.	Clinical Building.
1-2	Medicine	Prof. Nothnagel and Dr. Nippert	Sections.	Clinical Building.
1-2	Gynecology	Prof. Abbott and Drs. Benjamin and Cutts.	Sections.	Clinical Building.
1-2	Surgery	Prof. Moore and Dr. Wright.	Sections.	Clinical Building.
1-2	Eye and Ear	Prof. Todd and Drs. Reamer and Litzenberg	Sections.	Clinical Building.
			Sections.	Clinical Building.
1-2	Dermatology	Prof. Vander Horck and Dr. Burgan	Sections.	Clinical Building.
1-2	Nervous Diseases	Prof. Jones	Sections.	Clinical Building.
1-2	Children	Prof. Roberts	....	....
2-3	Nervous Diseases	Prof. Jones	Class	City Hospital.
3-4	Dermatology	Prof. Vander Horck	Class	City Hospital.
4-6	Autopsies	Prof. Stewart	Sections.	City Hospital.

SATURDAY.

9-11	Surgery	Prof. Dunsmoor	½ Class.	Asbury Hospital.
9-11	Surgery	Prof. Moore	½ Class.	St. Barn. and City Hos.
11-12	Surgery	Prof. Dunn	½ Class.	St Mary's and City Hos.
11-12	Children	Prof. Roberts.	½ Class.	City Hospital.

NOON RECESS.

1-2:30	Medicine	Prof. Hunter	½ Class.	St. Barnabas Hospital.
1-2:30	Medicine	Prof. Staples	½ Class.	City Hospital.
2:30-4	Medicine	Dr. Head	Sections.	City Hospital.
4-6	Autopsies	Prof. Stewart	Sections.	City Hospital.

Clinical Building open daily from 12 to 2 for seniors, and for juniors at the same hour on their Thursday clinic in Minneapolis.

Obstetric clinics throughout the year by Prof. Cates and Dr. Cutts at City Hospital and Clinic Building.

ST. PAUL CLINICS.

1901-1902.

THURSDAY.

8:30-9:30.	Orthopedia	Prof. Gillette	Class	St. Luke's or City Hos.
10-12	Surgery	Prof. Ohage Dr. Rogers	½ Class	St. Luke's, St. Joseph's or City Hospital.
	Gynecology	Prof. McLaren	½ Class	

NOON RECESS.

1:30-2:30	Medicine	Dr. Senkler	2 Sectio's	Dispensary.
	Medicine	Dr. Henderson	2 “	Dispensary.
	Surgery	Dr. Warren Dennis	Section	Dispensary.
		Dr. H. P. Ritchie	“	Dispensary.
	Eye and Ear	Prof. Fulton	“	Dispensary.
	Nose and Throat	Prof. Schadle	“	Dispensary.
	Nervous Diseases.	Dr. Dunning	“	Dispensary.
2:30-3:30	Medicine	Prof. Greene	Class	Dispensary.
4:00-5:30	Medicine	Prof. Abbott	Section	City Hospital.
	Dis. of Children	Dr. Christison	“	City Hospital.
	Medicine	Dr. Senkler	“	City Hospital.
	Medicine	Dr. Henderson	“	City Hospital.
	Pathological Anat.	Dr. Rothrock	“	City Hospital.

SATURDAY.

8:30-9:30	Nervous Diseases	Prof. Riggs	Class	Free Dispensary.
10-12	Surgery	Prof. Wheaton	Class	City Hospital.

NOON RECESS.

1:30-2:30	Medicine:	Prof. Greene	Section	Dispensary.
	Medicine	Dr. Senkler	“	Dispensary.
	Medicine	Dr. Henderson	“	Dispensary.
	Nose and Throat	Prof. Schadle:	“	Dispensary.
	Eye and Ear	Prof. Fulton	“	Dispensary.
	Nervous Diseases.	Dr. Dunning	“	Dispensary.
	Skin and Venereal.	Prof. Foster	“	Dispensary.
	Genito-Urinary	Dr. Coon	“	Dispensary.
3:00-4:00	Medicine	Prof. Abbott	Class	City Hospital.
4:00-5:00	Medicine	Prof. Abbott	Sections	City Hospital.
	Dis. of Children	Dr. Christison	“	City Hospital.
	Medicine	Dr. Senkler	“	City Hospital.
	Medicine	Dr. Henderson	“	City Hospital.
	Pathological Anat.	Dr. Rothrock	“	City Hospital.

HOSPITAL APPOINTMENTS.

Upwards of twenty hospital positions are open to graduates of this college. Most of these positions are secured through competitive examinations. Graduates of this college often receive appointments as resident physicians in the hospitals for the insane of this and adjoining states. A few appointments are awarded to undergraduates, by means of competitive examination.

ALUMNI ASSOCIATION

The annual meeting of the alumni association of the college of medicine and surgery will occur at 8 p. m. on Alumni Day, June 4th, 1902, in Medical Hall. The association may be addressed through its secretary, Dr. C. A. Erdmann. The alumni of this college are requested to send their names and addresses to the secretary.

CORRESPONDENCE.

N. B.—All correspondence relating to this college should be addressed to Dr. Parks Ritchie, Dean, College of Medicine and Surgery, University of Minnesota, Minneapolis.

College of Homeopathic Medicine and Surgery.

THE FACULTY.

Cyrus Northrop, LL. D., *President.*

Alonzo P. Williamson, LL. B., M. D., *Dean, and Professor of Mental and Nervous Diseases and Medical Jurisprudence.*

William E. Leonard, A. B., M. D., *Professor of Materia Medica and Therapeutics.*

George E. Ricker, A. B., M. D., *Professor of Clinical Medicine and Physical Diagnosis*

Robert D. Matchan, M. D., Thomas J. Gray, M. D., *Professors of Principles and Practice of Surgery.*

Warren S. Briggs, B. S., M. D., Marshall P. Austin, M. D., *Professors of Clinical and Orthopædic Surgery.*

B. Harvey Ogden, A. M., M. D., *Professor of Obstetrics.*

Eugene L. Mann, A. B., M. D., *Professor of Diseases of Nose, Throat and Ear.*

Frederic M. Gibson, M. D., O. et A. Chir., *Professor of Ophthalmology.*

George E. Clarke, Ph. B., M. D., *Professor of Theory and Practice of Medicine.*

George F. Roberts, M. D., Edward E. Austin, M. D. *Professors of Diseases of Women.*

Harry M. Lufkin, M. D., *Professor of Diseases of Children.*

Thomas J. Gray, M. D., *Professor of History and Methodology of Medicine.*

Robert R. Rome, M. D., *Professor of Clinical Obstetrics.*

——————————, *Professor of Skin and Genito-urinary Diseases.*

O. K. Richardson, B. S., M. D., *Lecturer on Life Insurance Examination.*

Edward M. Freeman, B. S., *Instructor in Botany.*

Earl Hall, *Dispensary Assistant.*

E. A. Booth, *Lecturer on Surgical Emergencies.*

E. A. Comstock, *Lecturer on Clinical and Orthopædic Surgery.*

Instruction in the following branches is received in common with the students of the other colleges in the department of medicine.

Charles A. Erdmann, M. D., *Professor of Anatomy.*

Richard O. Beard, M. D., *Professor of Physiology.*

Charles J. Bell, A. B., *Professor of Chemistry.*

Thomas G. Lee, B. S., M. D., *Professor of Histology and Embrylogy.*

F. F. Wesbrook, M. A., M. D., C. M., *Professor of Bacteriology and Pathology.*

The College of Homeopathic Medicine and Surgery.

RULES AND REGULATIONS OF THE DEPARTMENT.

COLLEGE YEAR.

The fourteenth annual course of study in this department will begin on September 17th, 1901, and will continue eight and one-half months, closing upon the first Thursday in June, 1902. The college of dentistry, in this department, will begin work September 11th and the college of pharmacy October 2nd.

The college year is divided into semesters; the first semester ending January 25th, 1902. The succeeding week will be devoted to mid-year examinations which will be conducted in many of the departments. The second semester will begin February 4th, 1902, and will close May 17th, 1902, when the final examinations of the year will begin. Commencement exercises will occur in common with the other departments of the University, during the week ending June 7th, 1902.

ENROLLMENT.

It is desirable that students matriculate before September 10th.

Students will be assigned seats in the order of and at the time of their matriculation. Such matriculation and assignment of seats will be had in the office of the registrar of the University. Students will then present themselves for entrance examination, or for the approval of their evidences of preliminary qualification, to a committee of the college of science, literature and the arts appointed for this purpose. Having received an entrance certificate from this committee they will report to the dean of the college which they desire to enter, for admission and classification. They will then be furnished with a record of their standing and of the studies to be taken and they will be required to present this record to the professors in charge of such studies within the first week of the term.

ENTRANCE EXAMINATIONS.

In accordance with an agreement between the University of Minnesota and Hamline University, the requirements for admission to their medical departments, which represent all the medical schools of the state, are, at present, uniform.

During the session of 1901-02 students will be admitted to this coll upon passing the regular entrance examinations to the colleges science, literature and the arts, as unified by the presidents of University of Minnesota and Hamline University. The subjects of ex ination are:

English composition and rhetoric, one year.
Physics, one year.
Physiology, elementary course.
United States history, one year.
History of Greece and Rome, one-half year.
Algebra, elementary, one year.
Geometry, plane, one year.

Latin Grammar, one year: Cæsar, four books; Cicero, four orati Vergil, four books.

German or French, two years, or one year of each, will be accepted lieu of Cicero and Vergil.

Graduates of any Minnesota State high school will be admitted wi **out examination, provided—**

(1) That the school maintain a **full four-year course** of high sch work.

(2) That the applicant present to the dean the principal's certific showing the satisfactory completion **of all the studies required for** **mission.**

(3) No student will be admitted **if conditioned in more than t** **subjects.**

Graduates of the **advanced courses of Minnesota Normal Scho** will be admitted upon the same terms as graduates of State high schoo Any Minnesota high school or academy **not under supervision of** **State High School Board,** but requiring for graduation **a four-yea** **course,** exclusive of the common school branches, conforming **essentia** **in distribution of time** to the entrance requirements of this college, **m** **be accredited by the faculty** in all respects as are the State high scho

Graduates from schools in other states, whose diplomas admit **reputable colleges,** will be received, subject to the regulations that ap to graduates of Minnesota State high schools.

N. B.—Notice is given that in the session of 1902-3 the requirements admission to this college will be those for admission to the sophomore cl of the college of science, literature and the arts, and that in the session 1903-4 they will be those for admission to the junior class of said college.

CONDITIONS.

Examinations of conditioned students and of applicants for advanc standing, in the common studies of the first and second years, will be he in these branches upon the following dates:

September 19, 9 a. m.	Anatomy, first year;	Physiology, second ye
September 19, 2 p. m.	Histology, first year;	Chemistry, second ye
September 20, 9 a. m.	Physiology, first year;	Anatomy, second ye
September 20, 2 p. m.	Chemistry, first year;	Histology, second ye

Conditions may also be removed at the close of each semester.

Candidates for graduation who carry conditions in studies of previous s must remove these conditions at the end of the first semester in order eligible for final examinations.

Students who carry conditions into a succeeding year may find a result- conflict of study hours. In that event they will give preference to the nished studies of the lower conflicting course.

CLASSIFICATION.

September 21st and 23rd will be devoted to the classification of students. opening lecture of the course will be delivered at 8 p. m., September .

STANDING.

The standing of students is determined by the results of recitations, ten examinations and laboratory work. It is indicated by the terms sed" or "conditioned." Conditions may be removed as indicated above. mplete work must be made up before the final examinations of the fol ng year.

Students must pass a majority of the studies of their year in order to sify in the next succeeding year.

In the studies of the first and second years, the classes will recite in sec- during hours regularly assigned for this purpose.

Habitual absence without a satisfactory excuse, continued indifference udy, or persistently poor scholarship may subject the student to tem- ry or permanent suspension.

ADVANCED STANDING.

Applicants for advanced standing must pass the entrance examinations, resent the usual equivalents. They must furnish satisfactory evidence ne spent and subjects covered in previous professional studies and present themselves at the above dates and pass the examinations in ranches in which they wish to be exempt, excepting under the condi- of collegiate study stated below.

No conditions of advanced standing will entitle the student to take the years of any graded study coincidently.

Students will not be permitted to substitute private work in any branch he regular college course work, excepting in the case of actual labora- exercises done under the direct supervision of an instructor appointed he chair and approved by the faculty. Examinations in such private ratory work will be conducted by the chair. This rule does not apply nditioned students.

Seniors in the college of science, literature and the arts, who contem- entering the department of medicine, are permitted to elect courses natomy, histology and embryology, physiology and chemistry in this de- ment in lieu of similar science courses in the college of science, litera- and the arts. Since the medical practice act of this State requires four full years of medical study, these students are encouraged to elect this work in the department of medicine. This election will be contributive toward the degrees given in both colleges. Reciprocally, however, the college of medicine and surgery will accept full courses, taken in the college of science, literature and the arts, in histology and embryology, physiology and chemistry in lieu of its first year's work in these branches.

For a statement of fees, either charged or credited in these elected studies, see below.

ATTENDANCE.

Students are required to attend four-fifths of the lectures in each course. This rule is not intended for the benefit of those who seek admission after the opening of the college year, but is designed to cover cases of sickness or unavoidable absence. It does not apply to laboratory courses which must be taken in full and must be entered, invariably, during the first week in which they begin.

TERMS OF TUITION.

The college has adopted a system of level fees, in which are included all charges of matriculation, lecture courses, laboratory courses*, dissections and graduation. These level fees are as follows:

For the first year	$100.00
For the second year	100.00
For the third year	80.00
For the fourth year	80.00

One-half of the annual fee will be payable when the student matriculates. The registrar's receipt for this portion of the fee will entitle the holder to take the entrance examinations and to classify. The second half will be payable at the opening of the second semester, February 4th, 1902. If the applicant fails to pass the entrance examinations,his fees will be returned by the registrar. Absence or failure to continue study will not entitle the student to return of fees, excepting in cases of special hardship, when application may be made to the executive committee of the Board of Regents.

A student who takes advanced standing will receive only a credit of five dollars upon his annual fee per semester of each laboratory course from which he may be exempt.

Senior students in the academic department of this University who elect first year studies in this college, during their senior academic year, will be admitted to each of such studies upon payment of a fee of fifteen dollars.

Students who are conditioned and fail to remove their conditions within one year will be charged an extra examination fee.

Senior conditioned students who re-enter for work in any succeeding year will be charged a matriculation fee of ten dollars.

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*In each semester a fee of $2.00 will be charged for the rental of a microscope in each course in which its use is required, provided the student is not supplied with a satisfactory instrument of his own. It is an advantage for the student to possess a microscope.

BREAKAGE AND LOSS.

In each laboratory course the student will be assigned a certain amount of apparatus and material, for which he will give a receipt.

For apparatus and material attaching to his laboratory desk he will also be held responsible. At the end of each course, if such apparatus and material are restored in good condition, this receipt will be returned to him.

A deposit of five dollars will be made with the registrar each year, by every student, at the time of enrollment, as *a caution fee*. This fee is intended to cover the cost of unnecessary damage in the college buildings and of breakage and loss of laboratory apparatus and materials. It will be returned to the student at the close of each year, minus the cost of articles assigned to him, which are not returned in good condition, or of damage to college property for which he is individually responsible. If responsibility for such damage cannot be individually fixed, a pro rata charge upon all students will be made.

SPECIAL STUDENTS.

Special students will pay to the registrar a fee of twenty dollars per year for each study they elect to pursue. They will be charged fees, varying from five to twenty dollars, for each laboratory course they may enter.

Graduate students will pay an admission fee of ten dollars which will entitle them to attend any lectures they may desire in regular courses, but such attendance does not entitle them to any credits unless they pass the required entrance examination.

Senior students who fail to graduate by reason of conditions will be charged a registration fee of ten dollars.

CURRICULUM.

The course in the college of homeopathic medicine and surgery leads to the degree of doctor of medicine. It covers a period of four years of collegiate study, each year representing eight and one-half months in actual residence.

The studies are graded, so far as practicable, throughout the four years and this grading is arranged with careful reference to the relation which the subjects naturally bear to each other.

The work of the first two years deals with the so-called scientific or laboratory branches; while that of the last two years includes the principles and practice of medicine and surgery, their associated specialties and the application of scientific or laboratory methods to clinical experience.

DEGREES.

The degree of doctor of medicine is conferred by the Board of Regents upon students who are commended, by vote of the faculty, for graduation.

Candidates for the degree must possess the following essential qualifications:

(1) Twenty-one years of age and upwards.

(2) Good moral character.

(3) A degree of preliminary education equivalent to that demanded by the examination for entrance to this college.

(4) Four full college years spent in the study of medicine; the fourth year, at least, in this University, and the remainder in this or other recognized college of medicine.

(5) Satisfactory examinations passed in all branches in accordance with the foregoing rules.

ANNOUNCEMENT.

THE COLLEGE OF HOMEOPATHIC MEDICINE AND SURGERY offers special advantages to all students seeking a medical education. Through the generosity of the State, an equipment of buildings, laboratories and apparatus is provided, equal to that of the best medical schools in this country or in Europe. With this equipment it is possible to lay that broad foundation for a medical education, without which no physician can hope for the highest success. An institution deficient in the requirements for teaching the fundamental branches of medical practice cannot long maintain the confidence of the medical profession. The claim once made that homeopathic medicine could be mastered in a few months study of materia medica and symptomatology, no longer meets the demands of an intelligent patronage. Homeopathy, as an expanding science, draws toward itself as a part of its rightful possession, every addition to medical knowledge that can be of any service in the cure of the sick. The homeopathic physician should feel that he is the "heir of all the ages" in medical learning, having that catholicity of training which places at his command every known resource, including as his especial advantage, the added power of coping with disease, that comes from his knowledge of the science of homeopathy.

The breadth of view this result implies as provided in the college of homeopathic medicine and surgery in a real university course of study in, first: the history of medicine, botany, chemistry (organic and inorganic), histology, embryology, bacteriology, pathology, anatomy, physiology, hygiene and sanitary science, with all the accessories of laboratory work; second: in building upon this foundation a comprehensive knowledge of therapeutics, practice and surgery. The student has daily training in both the practical and theoretical aspects of medicine. In the first two years the practical training is provided in constant individual work in the laboratories or dissecting rooms; in the last two in a broad field of clinical study and observation, in both medical and surgical cases, which the nearly one-half million population of the twin cities abundantly supplies. The theoretical work is carried on in daily didactic lectures and text-book study throughout the entire course.

Especial emphasis is placed upon clinical instruction in both dispensary and hospital practice. Senior students will have opportunity to attend outdoor patients, assist in special and general operations, and to attend obstetrical cases during the last course of lectures.

The college has now fairly passed the formative experiences incident to the early life of institutions and has become an integral part of the educational and professional forces of the state. Its alumni now at work in the state, are the evidence of the character of its work. The loyal support of the profession throughout the northwest has encouraged and upheld the faculty in giving form to this new phase of the state work.

The college proposes to stand for a broad catholic, scientific, and therefore homeopathic, education in medicine and surgery.

EXAMINATIONS.

Examinations will be conducted at the end of each year, upon subjects taught during the year, according to the schedule printed elsewhere. Attendance upon at least four-fifths of the lectures under each department is required in order that a student may be allowed to enter for final examination, or to receive a certificate of attendance. Ten per cent of the graduating class will be recommended to receive the degree of doctor of medicine, "*cum laude.*" The selection will be based upon the efficiency of the work of the student during the period of the entire course.

CLINICS.

Every member of the faculty (with two exceptions) is a clinical teacher. Thus each professor demonstrates the application of his didactic work.

DISPENSARY CLINICS.

The dispensary, located at 1808 Washington avenue south, offers unusual facilities to the student for individual examination of patients. The location is within easy access of those whose means compel them to ask dispensary assistance, and presents ample opportunity for the study of all forms of disease usually met with in practice. Patients present themselves in large numbers daily (more than six thousand prescriptions having been made during the last year), and are assigned to particular departments according to the nature of their diseases. The classes are so divided and arranged as to afford every student abundant opportunity to familiarize himself with the best methods of diagnosis and treatment of the various maladies, medical and surgical, with which the clinic abounds. The college clinics are conducted throughout the entire year. Students and practitioners are invited to attend them at all times.

DISPENSARY CLINICS.

SUBJECTS	CLINICIAN	DAYS IN ATTENDANCE	HOURS
DISEASES OF WOMEN	DR. F. L. BECKLEY	Monday	1 to 2
	PROF. E. E. AUSTIN	Thursday	1 to 2
NERVOUS DISEASES	PROF. WILLIAMSON	Monday and Friday	1 to 2
DISEASES OF THE EYE	PROF. GIBSON DR. E. E. HURD	Tuesday and Saturday	1 to 2
DISEASES OF THE SKIN	PROF. LEONARD	Tuesday	1 to 2
DISEASES OF THE NOSE, THROAT AND EAR	PROF. MANN DR. E. H. SMITH	Wednesday and Saturday	1 to 2
OBSTETRICS	PROF. ROME	Wednesday	1 to 2
SURGERY	DR. H. C. ALDRICH	Monday	1 to 2
	DR. A. E. BOOTH	Tuesday	1 to 2
	DR. P. A. HIGBEE	Wednesday	1 to 2
	PROF. M. P. AUSTIN	Thursday	1 to 2
	PROF. GRAY	Friday	12 to 1
	DR. A. E. COMSTOCK	Saturday	1 to 2
INTERNAL MEDICINE	DR. O. K. RICHARDSON	Monday and Thursday	1 to 2
	DR. P. A. HIGBEE	Tuesday	1 to 2
	PROF. RICKER	Friday	1 to 2
	DR. D. W. HORNING	Saturday	1 to 2
DISEASES OF CHILDREN	DR. MARGARET KOCH	Tuesday and Thursday	1 to 2
	PROF. LUFKIN	Saturday	1 to 2

HOSPITAL CLINICS.

The college has unusual advantages in hospital clinics. In addition to the calling upon students to assist the various professors in private cases, regular clinics are provided in the city hospitals of both St. Paul and Minneapolis, and in St. Luke's and St. Joseph hospitals in St. Paul. Each Monday is devoted to clinics held in one of these hospitals by a member of the faculty.

MINNEAPOLIS.

October 7th and 21st, 1901.
November 4th and 18th, 1901.
December 2nd, 16th and 30th, 1901.
January 6th and 20th, 1902.
February 3rd and 17th, 1902.
March 3rd and 17th, 1902.
April 7th and 21st, 1902.
May 5th and 19th, 1902.

ST. PAUL.

October 14th and 28th, 1901.
November 11th and 25th, 1901.
December 9th and 23rd, 1901.
January 13th and 27th, 1902.
February 10th and 24th, 1902.
March 10th, 24th and 31st, 1902.
April 14th and 28th, 1902.
May 12th and 26th, 1902.

CITY HOSPITAL, MINNEAPOLIS.

The faculty of the college of homeopathic medicine and surgery is largely represented on the staff of this institution, where one-third of all the patients admitted are placed under their care.

CITY HOSPITAL, ST. PAUL.

This hospital likewise has a full staff of homeopathic physicians and surgeons which includes all the St. Paul members of the college faculty. Each member of the staff is on duty two months of the year and has charge of all cases coming into his department during that time and uses suitable ones for clinical purposes.

HOSPITAL APPOINTMENS.

Graduates for this college are eligible for appointment to the position of interne in the Minneapolis City, St. Paul City and County Hospitals and St. Joseph's Hospital, St. Paul. Also to the staff of the State Hospital for Insane at Fergus Falls.

ST. LUKE'S HOSPITAL, ST. PAUL.

This hospital has recently erected a new building thoroughly equipped with all modern facilities for caring for medical and surgical cases. It contains an amphitheatre in which clinical lectures are delivered. A number of the faculty are members of the visiting staff.

ST. JOSEPH'S HOSPITAL, ST. PAUL.

Through the addition to its staff of members of the college faculty, students have access to both the surgical and medical cases upon exactly the same footing as the other hospitals.

GENERAL REMARKS.

In all hospital work students are given special bedside instruction in diagnosis, in "taking the case," in prescribing, in surgical dressing, in the after care of patients and all forms of accessory treatment.

ACKNOWLEDGEMENTS.

In continuance of the custom established five years ago, an invitation was extended to members of the profession, not connected with the college, serving upon the staffs of the several hospitals of the two cities, to lecture or present clinical demonstrations to the students. The faculty desire to express its appreciation to the following physicians and surgeons for their generous acceptance of the invitation: Drs. Adele S. Hutchison, Pearl M. Hall and H. C. Aldrich, of the City Hospital staff, Minneapolis, and Drs. Henry Hutchinson and O. M. Hall, of the staff of the City and County Hospital, St. Paul, and St. Luke's Hospital, St. Paul. The faculty is also under obligations to Dr. O. K. Richardson, of Minneapolis, for a series of very valuable lectures on Life Insurance Examinations, and to Dr. F. B. Kremer for a course of lectures upon Diseases of the Teeth, accompanied by demonstrations in extracting.

COURSE OF INSTRUCTION.

The extension of the course of instruction to four years enables the faculty to present to the students a more thorough and practical training in the practice of medicine than has heretofore been possible. The schedule of study is so arranged that the student reaches the practical work of his profession by gradual steps through theoretical and labratory courses. There are also offered lectures upon subjects which have been omitted in previous years, because of lack of time.

FIRST YEAR.

History and methodology of medicine.
Medical terminology.
Medical botany.
Inorganic chemistry—laboratory.
Histology and embryology—laboratory.
Anatomy—bones muscles and joints.
Physiology.
Homeopathic pharmacy.

SECOND YEAR.

Materia medica—experimental.
Organic chemistry—toxicology and urinalysis.
Histology and Embryology—laboratory.
Anatomy, dissection.
Physiology—chemical and experimental.
Surgical emergencies and bandaging.

THIRD YEAR.

Surgical anatomy.
Bacteriology, general pathology.
Materia medica and therapeutics.
Practice of medicine, organon and institutes of medicine.
Clinical medicine and physical diagnosis.
Obstetrics.
Principles and practice of surgery.
Diseases of women.
Ophthalmology.
Nose, throat and ear.
Medical jurisprudence.
Clinics, medical and surgical.

FOURTH YEAR.

Surgical pathology.
Materia medica and therapeutics.
Practice of medicine.
Clinical medicine.
Mental and nervous diseases.
Dermatology and genito-urinary diseases.
Obstetrics.
Clinical obstetrics.
Principles and practice of surgery.
Ophthalmology.
Diseases of women—didactic and practical.
Orthopædic and clinical surgery.
Paedology.
Electro therapeutics.
Life insurance examinations.
Clinics, medical and surgical.

MATERIA MEDICA AND THERAPEUTICS.

The course upon this topic is graded to cover four year's study. Lectures, daily quizzes and daily demonstrations of materials and methods are held regularly throughout the year, pains being taken to fit each student for the actual practical application of his knowledge.

FIRST YEAR.

One lecture each week for the first half of the year, is given upon the methods of homeopathic pharmacy, each student being trained in writing and filling prescriptions and the technique of the more common preparations. Apparatus and material for these purposes are taken from Prof. Leonard's laboratory, which is abundantly supplied with the crude and perfected drugs for demonstration throughout the course. Mr. G. A. Babendrier, who has kindly given this instruction so satisfactorily for several years, will continue the same the coming year.

SECOND YEAR.

Lectures and quizzes twice each week upon the toxicological and physiological action of a few drugs, each typical of a class of remedies, thus furnishing the ground work for a more detailed study of symptoms in later years. As far as possible, actual experiments in testing drugs upon members of the class will be made, the blanks used and methods being under Prof. Leonard's personal supervision and in accordance with the rules of the Provers' Union of the American Institute of Homeopathy.

THIRD YEAR.

Three lectures a week with quizzes, upon the vegetable remedies, about thirty major and seventy-five minor drugs, arranged according to their natural groups and their clinical relationships in diseases, and studied in their origin, history, preparation, physiology and symptomology, full practical comparison being made with other allied remedies. The endeavor in these studies and those of the following year will be to present only such usage of drugs as is practical and fully corroborated, little, if any, time being spent upon their minor and less fully proven applications.

FOURTH YEAR.

Three lectures and quizzes each week upon the mineral, animal and nosological remedies of the materia medica—about forty major and twenty minor drugs, grouped and studied in detail as those of the second year, attention being given to their toxicology and physiological action, where this has a direct bearing upon their homeopathic application to chronic diseases, in as much as the drugs of this course are more often applied thereto.

Examinations in the form of written review quizzes from time to time or at the end of the term, will be held, the student's final standing being made up of this and his daily quiz markings.

THEORY AND PRACTICE.

Lectures on the theory and practice of medicine will be delivered to students of the third and fourth year. It will be the purpose to thoroughly acquaint the student with the description, course and diagnosis of disease, and the method of treating such disease in accordance with the homeopathic law of cure.

The cardinal principles of the philosophy of homeopathy will be clearly presented in didactic and clinical lectures. Students are familiarized with accurate methods of investigation, records of symptoms and history of cases, with the use of the repertory to assist in accurately affiliating the indicated remedy.

THIRD YEAR.

The course of the students of the third year consists of twenty-six didactic lectures, mainly on the diseases of the mouth, stomach and bowels. Eight lectures will be given on the philosophy of homeopathy. Frequent selections of cases from private practice will be given to better set forth the various lectures, as well as methods employed in the record of cases and selection of the remedy. One-half of the time allowed will be employed in frequent quizzes and review of the work gone over.

FOURTH YEAR.

The course to students of the fourth year consists of twenty-two didactic lectures on pulmonary and hepatic affections, with such of the important continued fevers as fall to this chair. The organon work will take the form of frequent "class-room talks," chiefly on the subjects of the following sections, viz: 272-274; 247; 245-251; 252-251; 167-168; 204-205.

In addition, students will be required to present written reports of the history and symptoms of cases treated, the repertory work in selecting the remedy, and dose, repetition and results. Much time and attention will be given to this feature of the course as tending in the highest manner to perfect the pupil in the art of *accurate prescribing*.

PHYSICAL DIAGNOSIS.

The course on physical diagnosis consists of a series of twenty-four didactic lectures to the third year class illustrated upon the healthy human subject, thus familiarizing the student with the normal appearances, feelings and sounds. These lectures are classified as follows: Introduction, general examination, respiratory system, circulatory system, digestive system, urinary system.

CLINICAL MEDICINE.

FOURTH YEAR CLASS.

For this course abundant material is found in the University homeopathic free dispensary, where clinics are held twice a week, and in the City Hospitals of Minneapolis and St. Paul, where the clinics are held each Monday morning.

In these clinics particular effort is made to supplement the course in physical diagnosis and to fully illustrate the application of the homeopathic law in therapeutics.

In order that the student may obtain as wide a view as possible in this all important branch, they receive instruction not only from Professor Ricker at the bedside in the City Hospital wards, but from the various members of the homeopathic staffs in the Twin Cities, attending the hospitals but not otherwise connected with the University.

In addition the dispensary furnishes many outside cases which are treated in their own homes by the members of the fourth year class, under the supervision of Professor Ricker, thus enabling the student to acquire the self-reliance and confidence so necessary to the beginning practitioner.

SURGERY.

Two years ago the work in surgery was greatly enlarged. It now occupies two full years, the third and fourth, and includes the labors of four members of the college faculty. The work is divided into clinical and didactic surgery.

CLINICAL SURGERY.

The work in clinical surgery will consist in operations before the class, in connection which clinical lectures will be given upon the cases presented. These will occupy each Monday of the fourth year, which is set apart as the day for clinics. The third year class is required to attend the clinics, unless their regular class work interferes. The second year students will receive thorough practical instruction in bandaging two hours each week, two semesters.

The diagnosis, prognosis and homeopathic treatment and the operations for surgical diseases and accidents will be taught practically.

At the clinics which are held at the City and County Hospital, St. Luke's and St. Joseph's Hospitals, of St. Paul, and the City Hospital and Free Dispensary, of Minneapolis, are demonstrated the value of antiseptic and aseptic treatment of wounds, the minute details of the application of surgical appliances and dressings, and operative technique. Post-operative care for reaction, shock, etc., will be considered.

Senior students are instructed in the practical use of anæsthetics and are required to attend a number of surgical patients at their homes, carrying out post-operative detail under the direction of the professor.

DIDACTIC COURSE.

The didactic course covers the entire field of the principles and practice of surgery The lectures will occupy the third year class two hours and the fourth year class three hours each week. Demonstrations will be made upon the cadaver, aided by models and charts.

The lectures to the third year class will include surgical pathology, inflammation, hemorrhage, surgical appliances, surgical emergencies, minor surgical operations, ligation of arteries, burns and scalds, surgical treatment of the anus and rectum, antiseptics, anæsthetics, abscesses, ulcers, gangrene, hernia and the elements of the treatment of wounds, fractures, dislocation and amputation.

The lectures of the fourth year class will include the surgery of the bones, joints, genito-urinary organs, tumors, cysts, fractures, dislocations, amputations, syphilis, together with the operative surgery of the head, face, chest, abdomen, pelvis, skin, nerves and extremeties.

All the lectures will aim to be comprehensive, practical and in keeping with the best standards of advanced surgery.

ORTHOPAEDIA.

The course on this subject is both didactic and clinical. It consists of one lecture a week during the fourth year.

The whole subject of deformities, their causes, care and removal, is carefully considered in detail. The mechanical apparatus used in the treatment of such cases is exhibited and rules are laid down for the improvising and applying temporary means and instruments. Recent progress in the knowledging of the underlying causes of bony, muscular and habit deformities, and their serious reflex effects has led to great changes in the methods pursued to overcome them.

The early recognition and treatment of such cases are of the utmost importance and hence, as they are usually first presented to the general practioner, a full knowledge of this branch of surgery becomes exceedingly valuable.

The subjects discussed include functional and organic diseases of the bony spine, the several forms of club-foot, joint inflammations, both simple and tuberculous, and their sequela, cleft-palate, hair-lip, etc.

OBSTETRICS.

This subject will be taught by lectures and recitations, thoroughly illustrated with charts, manikins and specimens. The course will be graded and divided between the third and fourth years.

During the third year the subjects covered will embrace the anatomy and physiology of the female generative organs and the pelvis, the development of the embryo, the maternal changes of pregnancy, the diagnosis of pregnancy, the physiology, pathology and hygiene of pregnancy, the physiology and course of normal labor, the conduct of normal labor and the management of the puerperium.

During the fourth year the following subjects will be taught: the mechanism of labor. diagnosis and management of the varions presentations, dystocia, complications of labor physiology, pathology and management of the puerperium, and obstetric surgery.

CLINICAL OBSTETRICS.

This department will instruct the fourth year students and apply practically the teachings of the department of obstetrics. An abundance of material is supplied by the dispensary and city hospitals of St. Paul and Minneapolis. The student will be thoroughly educated to locate accurately the position and condition of the internal parts both in health and disease, the obstetric points of the pelvis, as well as the diameters, planes and curves, the presentations, and positions of the child and methods of diagnosis, the stages and mechanism of labor, the management of normal and abnormal labors, the application of the forceps and the necessary steps in performing version.

Each member of the class will be assigned at least three cases of pregnancy which he will be required to attend under the immediate direction of the professor of the chair.

During the last month of the pregnancy of a case as assigned, the student in charge will report to the professor the patient's name, address, age, number of previous labors, date of first and last labors, date of quickening, condition of uterus, heart, lungs, bowels, kidneys, etc., and a detailed statement regarding the appearance of the patient, location of the foetal heart. position of the child, character and size of the pelvis.

At the time of the labor the student will be required to keep a record of the following facts:

No. of the case, date name, address, condition of the os uterus, height of presenting part, pulse rate and quality (ante and post partum), rapidity of foetal heart beats and where heard most clearly, presentation, position and duration of the first, second and third stage.

Also the sex of the child, the diameters of its head, weight and length. The post partum condition of the uterus, cervix and perineum.

An operative course on the female cadaver will also be given, demonstrating the opera tive technique in symphisiotomy and Cæsarean section.

DISEASES OF WOMEN.

This course will consist of one didactic lecture during the third and fourth year and two clinics a week during the fourth year.

In the third year, both semesters, the anatomy, physiology and pathology of the pelvic contents and perineum are carefully prescribed. The preparation of the patient for surgical operation together with the necessary steps taken, the various surgical procedures as well as the medical treatment of all pelvic diseases, will receive minute attention during both semesters of the fourth year.

The medical and surgical diseases of women will be treated in didactic lectures and recitations. The entire field of gynæcology will be covered in the lecture room. As cases present themselves in the city hospitals of St. Paul and Minneapolis, the subjects thus described will be demonstrated on the living subjects.

DISEASES OF CHILDREN.

The course on this subject will consist of one lecture each week and two clinics to the fourth year students, and extending over two semesters. Ths clinics are full and afford an exceptional opportunity to study the common diseases of childhood. In the out-door department many cases of exanthematous cases are treated by the members of the class.

The didatic course embraces a description of the normal development of infancy and childhood natural and artificial infant feeding, signs and symptoms of hereditary syphilis, contagious and infectious diseases, tuberculosis. erysipelas, and the diseases of the respiratory and urinary organs; those of the circulatory, nervous and digestive systems, rhachitis and diseases of the skin.

MENTAL AND NERVOUS DISEASES.

This course consists of twenty-eight didactic lectures, in the fourth year, and as many clinical demonstrations as material is presented at the dispensary and the City Hospital, Minneapolis. It is the aim of the chair to qualify the student to detect the earliest symptoms of insanity and diseases of the nervous system.

The anatomy and physiology of the brain and spinal cord are reviewed, and particular attention is paid to the causes, development, characteristic symptoms and the pathological conditions of the diseases of the nervous spstem. The therapeutics, dietetics and direction for the personal care in each disease is especially elaborated.

ELECTRO-THERAPEUTICS.

This subject will be carefully taught. The physics of electricity will be sufficienty considered to enable the student to understand the construction and manipulation of galvanic faradic, sinusoidal and static batteries. The application of every form of electricity to diseases will be practically demonstrated.

OPHTHALMOLOGY.

In the department of ophthalmology the endeavor is to give thorough instruction in those parts of the work which will ordinarily come into the hands of the general practitioner.

The course is supplemented by as much practical work as time allows, in the use of the ophthalmoscope for the study of intraocular troubles whose recognition would aid in the diagnosis of various conditional affections; and following a short didactic course given early in the year on the subject, practical work in the correction of the refraction is carried on at the dispensary during both semesters.

The clinical material provided in the department is very abundant, interesting and instructive cases, embracing all varieties of eye troubles calling for medical and surgical aid being presented to the students bi-weekly throughout the entire year.

The following schedule shows the subjects considered in the present course of lectures.

Anatomy and physiology of the eye; refractions and use of the lenses for the correction of its errors; diseases of the lids; conjunctiva; cornea; sclera; lachrymal apparatus; iris and ciliary body; lens; choroid; retina and optic nerve; affections of the muscular apparatus of the eye and the general relationship between eye-strain and reflex and nervous disorders. The didactic course consists of thirty-two lectures during the fourth year and ten during the third year.

DISEASES OF THE NOSE, THROAT AND EAR.

The course will consist of the didactic lectures and clinical demonstrations.

One didactic lecture a week will be given to students of the third year. An understanding of the anatomy and physiology of the organs is presupposed and but little time will be devoted to the review of the more important points in their bearing upon diseases of these organs. The lectures will enter upon a study of the diseased processes in the nose—the various forms of acute and chronic catarrhal inflammation, their causes, development, symptoms, consequences and treatment, both general and local, abnormal growths, affections of the septum and diseases of the accessory sinuses, finishing the course on the nasal cavities with the neuroses, functional and organic.

The diseases of the naso-pharynx are treated with special reference to their dependence upon nasal conditions and their influence upon the organ of hearing. The course includes acute and chronic catarrhal processes. adenoid vegetations and morbid growth.

Diseases of the pharynx are considered in their dependence upon alimentary disorders, acute and chronic inflammatory conditions; morbid growths and neurosis, together with the pharangeal and tonsilar conditions incident to the exanthemata, diphtheria, typhoid fever, etc.

In the laryngeal disorders we become more closely associated with respiratory diseases; the various forms of laryngeal inflammation, morbid growths and nervous affections will be discussed—especial stress being put upon the early laryngeal manifestations of tuberculosis and the laryngeal disorders of voice users with the importance of proper vocalization and respiration upon all diseases of this organ.

Ear diseases resolve themselves into: Diseases of the external canal and pinna, dermoid inflammations; diseases of the middle ear, mucous inflammations; and diseases of the internal ear, serous and nerve inflammation.

The course to the fourth year students will be entirely clinical, the class being divided into sections for dispensary work; the aim will be to familiarize the students with the use of the various diagnostic means at their disposal, and the appearance of the various abnormal conditions, together with the technique of the numerous operative procedures. The material for clinical demonstration is abundant.

SKIN AND GENITO-URINARY DISEASES.

This course will consist of one didactic lecture, and one clinic each week for students of the fourth year. It will include the disease of the skin, syphilis and all genito-urinary diseases, including the kidneys.

The first semester wlll be devoted to a study of genito-urinary and kidney diseases, the second to diseases of the skin and syphilis. The dispensary clinics will be especially valuable in supplementing the work of the professor in the lecture room by familiarizing the students with the appearance of the various forms of skin diseases so essential to a correct diagnosis of the same.

MEDICAL JURISPRUDENCE.

The object of this chair is to familiarize the student with his duties, rights and responsibilities from a legal standpoint. The law on each subject discussed is carefully explained and illustrated, as far as possible, with adjudicated cases.

HISTORY AND METHODOLOGY OF MEDICINE.

The lectures given in this chair are an exposition of the philosophy and art of medicine by the historical method. The student is taught to see how in each age the *practice* of medicine has been the outgrowth of the beliefs current regarding the nature of man. Give to a student the theories held by a people regarding the constitution of matter, the nature of mind and force, and he can accurately foresee the medical science such a people will accept. The unfolding of the world's thought in medicine sets homeopathy in its high place and gives the student an outlook much needed in the profession. The tendency of medicine has always been to over-estimate the material side of man's nature and to make innumerable hypotheses to explain disease. The conflicts in medicine have been the clashing, not of opposite sects, but of antagonistic systems of thought, and reconciliation is possible only on the grounds of a higher science than that of mere sense knowledge. This ground is revealed in the history of the philosophy of medicine.

The course includes the medicine of the Egyptians, Persians, Indochinese, Hebrews, Greeks, Arabians and of Europe down to the present.

One lecture each week during the freshman year.

LIFE INSURANCE EXAMINATION.

This subject will be taught with the purpose of familarizing the student with all the duties and responsibitities belonging to the position of medical examiner.

HISTOLOGY AND EMBRYOLOGY.

The laboratory of histology and embryology occupies most of the first floor and portions of the third floor and basement of the laboratory of medical sciences.

The general laboratory, 44x72 feet, extends across the north wing and is abundantly lighted by large windows on three sides and part of the fourth. Study tables accommodating seventy students are placed directly under the windows. A second tier of desks provides for twenty other students. Each student is provided with a separate locker for the storage of apparatus and material. The special laboratory, 24x35 feet, for research work by advanced students, adjoins the general laboratory. The next apartment, the library of the laboratory, contains a reference library consisting of a small but carefully selected collection of related literature, both standard and periodical. In addition to the laboratory library, the other libraries of the University, together with the public libraries of Minneapolis and St. Paul, afford the student access to the best publications among current periodicals and monographs. The rooms across the hall are devoted to the office and private laboratories of the professor and his assistant. On the third floor are located a preparation room, a small laboratory for special students, a dark room, a room for copying and enlarging, and a laboratory for photomicrography and projection. In the museum on this floor are several cases containg series of embryos and histologic specimens. In the well-lighted basement are found a preparation room, 20x35 feet, for the hardening of tissues, &c., and an experimental laboratory and store room, 26x36 feet.

These laboratories are equipped with seventy-five Leitz' microscopes, each fitted with nosepiece and Abbé condenser, various forms of microtomes, such as freezing, Thoma, Minot, Schanze, &c., injection apparatus, aquaria, thermostats, incubators, water baths, chemical hoods, a great variety of technical glassware, Grübler's stains, a set of His' wax models, photomicrographic and reconstruction apparatus, charts, reference cabinets containing carefully selected slides, a large collection of hardened histological and embryological material with an abundant supply of fresh tissues.

The courses are made as practical as possible, beginning with the technique of the microscope, followed by the preparation of permanent specimens. Collections of typical specimens, also, will be loaned to the students for study. During the two years course the student will acquire a valuable collection of slides of his own preparation illustrating the structure and development of the human body.

The course is illustrated by charts and lantern-slides of histological and embryological specimens. Demonstrations are given under the microscope of typical sections of tissues and organs, accompanied by camera lucida drawings, or photo-micrographs, with explanatory text.

All students are recommended to purchase a microscope at the beginning of their medical course. This instrument is an indispensable part of the outfit of a well-trained physician. Suitable microscopes can be purchased at from $50 to $60, which may be fitted at any time with such other parts as may be desired.

Students not owning microscopes will be furnished with instruments at a rental of $2 per semester for each course requiring the use a microscope.

Course I. General morphology and histology.

Lectures, demonstrations and laboratory work. The course includes the structure and manipulation of the microscope, the structure and properties of protoplasm; the cell, its structure; cell division and reproduction, A detailed study of the structure and life history of certain typical unicellar animal and plant forms and of certain multicellar forms, leading to the consideration of the elements of structure in the vertebrata. A comparative study of the histology of the blood, of the epithelial, connective, muscular and nervous tissues and of the vascular and lymphatic systems. Lectures, etc., 2 hours a week. Laboratory work, 6 hours a week, 1st semester, 1st year.

PROFESSORS LEE AND NICKERSON AND M. L. NICKERSON.

Course II. Elements of embryology and histogenesis.

Lectures, demonstrations and laboratory work. A comparative study of reproduction; the ovum, the spermatozoon, fertilization, cleavage, formation of blastodermic layers, the formation of the embryo, foetal envelopes, etc., with practical work on chick and frog embryos. The differentiation and histogenesis of the tissue, etc. Lectures, etc., 2 hours a week; laboratory work, 6 hours a week, 2d semester, 1st year. Open to those who have completed course i.

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Course III. Human embryology and microscopic anatomy.

Lectures, demonstrations and laboratory work. Advanced methods of histological and embryological technique, with practical laboratory work. The comparative study of the morphology, microscopic anatomy, origin and development of the various organs of the integumentary, alimentary, respiratory and uro-genital systems, the central and sympathetic nervous systems, the organs of special sense, etc. Lectures, etc., 2 hours a week; laboratory work, 3 hours a week. 1st and 2d semesters, 2d year. Open to those who have completed the courses of 1st year in histology and embryology.

PROFESSORS LEE AND NICKERSON AND M. L. NICKERSON.

The full courses given in histology and embryology of vertebrates in the college of science, literature and the arts will be accepted in lieu of the first year's work in histology and embryology, in the department of medicine. See statement of fees, page 18.

The following courses are open to properly qualified students, and will consist of practical work in the laboratory, a prescribed course of reading, with reports of work, and of lectures and demonstrations to be given from time to time.

Course IV. Methods of microscopical work.

The preparation and use of the various solutions employed in fixing, hardening and staining; methods of embedding, sectioning, reconstruction, etc.

Course V. (*a*) *Comparative histology and histogenesis of tissues.*

The animal cell, the epithelial, connective, muscular and nervous tissues, blood, etc.

(*b*) *Comparative histology and embryology of the viscera.* The epidermal, digestive, respiratory and uro-genital systems of organs.

(*c*) *Comparative histology and histogenesis of the nervous system and sense organs.* Central nervous system, etc., after the methods of Weigert, Golgi, etc.

Course VI. *Comparative embryology of vertebrates.*

A detailed study of the various stages in the development of vertebrate types, as acanthias, petromyzon, trout, amblystoma, frog, chick, rat, pig and human embryos.

Research work in histology and embryology.

Opportunity will be offered for those desiring to pursue original investigations.

ANATOMY.

The department of anatomy occupies a separate building, adapted to its work and equipped with the best modern appliances. It includes two large students' dissecting rooms, the general laboratories of anatomy, a bone laboratory for bone research work, the offices of the professor and demonstrator of anatomy, preparation rooms, morgue and anatomical museum, to which has been added a complete series of casts from His' frozen sections.

The bones of the human skeleton are furnished to the student for purposes of study and recitations from the specimen are conducted by the demonstrator of anatomy.

A series of lectures upon syndesmology and angiology follows, accompanied by recitations which are illustrated by human preparations and by fresh and preserved sections of joints.

A course of descriptive lectures in myology is then given, with demonstrations upon the cadaver.

Lectures and a brief course of dissections of the abdominal and thoracic viscera of the lower animal complete the work of the first year in this branch.

In the second year, the student takes lectures, recitations and demonstrations upon the vascular system, the alimentary canal, the respiratory tract, the genito-urinary system and the inguinal and perineal structures. He then pursues a course in regional anatomy, embracing a study of the surgical regions of the entire body; a course in the anatomy of the eye and ear and of the brain, spinal cord and ganglionic system, illustrated by fresh and permanent preparations, models and diagrams.

He dissects, during the year, the entire human body, recites upon the subject and observes demonstrations made by a corps of assistants under the direction of the demonstrator of anatomy.

In the third year, the student takes up the study of the human body from a topographical standpoint and is given a thorough review of the surgical regions, emphasizing the practical points in the relations, structure and distribution of the nervous system.

Course I. *Osteology.*

Lectures and recitations upon the human skeleton and supplementary work on the osteology of domestic mammals: three hours each week, for 10 weeks of first semester. Recitations from the specimen taken by the class, in sections; 2 hours each section, for 10 weeks, first semester. Required of all first year students.

Course II. *Syndesmology.*

Lectures, recitations and laboratory demonstrations. 3 hours each week, for 4 weeks, first semester. Open to those who have taken course i.

Course III. *Myology and Angiology.*

Lectures and recitations, covering the entire muscular and arterial systems of the human body, with a supplementary study of comparative myology; 3 hours each week, 16 weeks. Laboratory work consists in identifying the muscles of the human body on dissected preparations and showing their actions. Class in sections, 4 hours each week, for five weeks. Open to those who have taken course ii.

Course IV. Splanchnology.

Lectures on the thoratic, abdominal and pelvic viscera, 3 hours each week for 10 weeks. Open to those who have taken course iii. Laboratory work in demonstrating and dissecting the thoracic, abdominal and pelvic organs of the human subject or of the dog or sheep. PROFESSOR ERDMANN.

Semi-weekly recitations upon the subjects of the first year's course, conducted in sections. DR. H. K. READ.

Course V. Splanchnology.

Descriptive and topographical anatomy of the thoracic viscera; the alimentary and urino-genital organs. Lectures and recitations, 3 hours each week, for 10 weeks. Required of second year students.

Course VI. Descriptive and surgical anatomy.

Head, neck, trunk and extremities. Lectures and recitations, 3 hours each week, for 12 weeks. Open to those who have completed course v.

Course VII. The nervous system.

Cerebro-spinal axis and its membranes; the cranial and spinal nerves; the sympathetic nervous system and the special-sense organs. Lectures, recitations and dissection of the brain, 3 hours each week, for 8 weeks. Open to those who have completed course vi. PROFESSOR ERDMANN

Course VIII. Dissections.

This work extends over two periods of 6 weeks each, requiring five afternoons of each week. The method of work follows that laid down in Holden's Manual of Dissections. DRS. H. K. READ and E. R. HARE.

The second year lecture and dissecting courses are open to those having completed the first year's work in anatomy and histology.

Weekly recitations, upon the subjects of the second years' course conducted in sections. PROFESSOR ERDMANN.

Course IX. Surgical anatomy.

The instruction consists of dissections, demonstrating the relations of structures composing the surgical regions of the body; demonstrations, upon the living subject, showing the anatomical and surgical landmarks and their applications; also the location, by surface tracings, of the viscera contained in the various cavities and of the important arteries, veins and nerves. 1 hour a week, second semester. Required of third year students. PROFESSOR ERDMANN.

Course X. Applied Anatomy of the nervous system.

Elective.

Opportunity is afforded for advanced work in practical anatomy at any time during the college year.

PHYSIOLOGY.

The department of physiology occupies a suite of rooms in the laboratory of medical sciences, including the laboratory of experimental physiology, the laboratory of physiologic chemistry and practical dietetics, a demonstration and recitation room, the laboratory library and the office of the professor in this branch. A large amphitheater, adapted to the demonstration of major experiments, immediately adjoins the physiologic laboratories and is used, also, for lecture purposes by this and other chairs.

In the basement of the laboratory of medical sciences, the chair maintains large and well-equipped animal-rooms, which are furnished with a large aquarium, frog tanks, animal enclosures and breeding cages. From this animal room are furnished supplies of material and animals for the work in experimental physiology, physiologic chemistry, histology, embryology, pathology and bacteriology. The hygienic conditions of the room are studied carefully, with a view to maintaining the physiologic and structural integrity of its animal occupants as perfectly as possible. Stock required for bacteriological purposes is removed and placed in an isolated department at a distance from the room.

The physiologic laboratories are equipped with a full supply of apparatus, instruments etc., for experimental purposes, and with materials, glassware, digesters, water baths, ventilating hoods, etc., for the work in physiologic chemistry. Their outfit includes sets of vivisection instruments, an artificial respiratory machine, batteries, Du Bois-Reymond coils, galvanometers, rheostats, moist muscle chambers, recording drums, Ludwig's kymograph, spring myograph, Burdon-Sanderson's stethometer, stethoscopes, Phonendoscopes, Dudgeon's and Marey's sphygmographs, cardiographs, Runne's chronograph, Roy's tonometer, Gaskell's clamp, oncometers, hæmometers, hæmoglobinometers, hæmatocrits, plethysmograph, etc. They are furnished with motor power for the operation of recording apparatus and for the manufacture of apparatus in the laboratory workshop.

The course in physiology is graded in the first and second years. In the first year, the student hears lectures, recites and attends demonstrations in general physiology. These embrace the discussion and, so far as possible, the observation of the physiologic ingredients of the animal body; the study of the physiology of cell-life, of the fundamental proper ties of the cell; of the nutritive media, blood, lymph and chyle; of the elementary functions of the nervous system; of the muscular tissues, the connective tissues and the epithelial tissues; of the vascular mechanism; of the alimentary canal; of the organs of secretion, respiration and excretion.

In the second year, the work is made as practical as possible and includes the study of such advanced topics as metabolism, nutrition, dietetics, reproduction; the physiology of foetal life, of infancy, of maturity and of old age; and the functions of the brain, spinal cord and ganglionic system. Three hours each week, during the first semester, are occupied in laboratory work in physiologic chemistry. This course affords the student a practical knowledge of the tissues and fluids of the body from a chemical standpoint. It embraces studies in the several classes of proteids, in fats, carbohydrates, bone, muscle, blood, milk, the digestive fluids, glycogen, etc.

A similar number of hours during the second semester are devoted to experimental physiology. For this work the class is divided into sections and the instruction is individualized so far as possible. The student is familarized with physiologic apparatus and its uses; with forms of electrical stimulation and with methods of experimentation; while his knowledge of physiologic principles is strengthened by the observation of functional facts. Demonstrative work is combined with the individual experiments performed by the pupil.

In the fourth year, an elective course in practical dietetics is conducted during the first semester. It deals with the analysis of foods, with the general principles of food preparation and with the selection of a suitable dietary for the several periods of life.

Practical talks upon the principles and means of food preparation, the serving of food, food selection, invalid and infant dietary, etc., are associated with this course. A trained instructor conducts the exercises in hygienic cooking.

A laboratory reference library is in process of collection, to which the advanced student will have access for collateral reading.

Course I. General physiology.

Lectures, recitations and demonstrations, dealing with the physiologic chemistry of the human body; the physiologic properties of the cell; the nutritive media; the nervous mechanisms in general; the muscular tissues, the connective tissues and the epithelial tissues, as the structural bases of the animal body. Two hours a week, first semester, first year. PROFESSOR BEARD

Course II. Systemic physiology.

Lectures, recitations and demonstrations. This course includes the physiology of the vascular system; the digestive system; the respiratory system; the secretory and excretory systems. Four hours a week, second semester, first year. Open to those who have completed course i. PROFESSOR BEARD

Semi-weekly recitations upon the subjects of the first year are conducted in sections of the class. PROFESSOR BEARD AND DR. M. R, WILCOX.

Course III, Advanced physiology.

Lectures, recitations and demonstrations. The course includes the discussion of the phenomena of metabolism; of nutrition; of temperature production, regulation and loss; of reproduction; of the physiologic changes incident to successive periods of life, and of the functions of the nervous system. Two hours a week, first semester; three hours a week, second semester, second year. Open to those who have completed the courses in physiology of the first year. PROFESSOR BEARD.

Semi-weekly recitations upon the subjects of this course are conducted in sections of the class. PROFESSOR BEARD AND DR. WILCOX,

Course IV. Physiologic chemistry and microscopy.

Laboratory work. A practical study of the several classes of proteids; of carbohydrates, fats, muscle and bone; of gastric juice, saliva, pancreatic juice and bile in their respective digestions; of glycogen, and of blood, lymph, chyle and milk. Microscopic study of the carbohydrates in vegetable and animal forms; of the physiologic emulsions of fat; of the crystalline waste products; and of the physiologic conditions of the blood-cells and the process of fibrin formation. Practical instruction is given during this course in the enumeration of the blood cells, in the estimation of hæmoglobin and of the corpuscles in mass, in the spectroscopic examination of the blood and in the use of the polariscope. Nine hours a week, first semester, second year. This does not represent the actual number of hours of work done by each student, since, during a part of the session, the class is divided into sections for practical exercises. Open to those who have completed courses i and ii. PROFESSOR BEARD AND DRS. WILCOX AND FLIGMAN.

Course V. Experimental physiology.

Laboratory work and demonstrations. A study of physiologic apparatus, electrical stimuli and methods of experimentation; the demonstration of experiments which illustrate physiologic function in the muscular, nervous, vascular, respiratory and glandular systems. Three hours a week, second semester, second year. Open to those who have completed course iv. PROF. BEARD AND DR. WILCOX.

Course VI. Practical dietetics. (Elective.)

Lectures and laboratory exercises. A study of food analysis, food preparation and of the general principles of food selection, including a discussion of invalid and infant dietary. Two hours a week, first semester, fourth year.
PROFESSOR BEARD AND MISS WILKINSON.

Opportunity will be afforded, in the laboratories of physiology and physiologic chemistry, for the pursuit of special courses of study, in both experimental and chemical physiology, under the direction of the chair.

Full courses in animal biology in the college of science, literature and the arts will be accepted in lieu of first year physiology in the department of medicine.

See statement of fees, page 18.

CHEMISTRY.

The work in this subfect is carried on in a building especially arranged for this work. The qualitative laboratory has a floor space of about 2300 square feet and accomodates 100 students at a time. It is used for instruction in general chemistry and analysis. It is well supplied with the usual apparatus. The quantitative laboratory has a floor space of about 1500 feet, and accomodates 68 students at one time. It is used for instruction in the analysis of the urine, quantitative analysis and organic chemistry. The chemical lecture room is situated in Medical Hall.

Course I. General inorganic chemistry, including qualitative analysis.

Lectures and recitations. 3 hours a week, first semester; 2 hours a week, second semester, first year. PROFESSOR BELL.

Laboratory work; qualitative analysis. 6 hours a week, first year, from October 1st to May 8th. PROFESSORS BELL AND CAREL

Course II. Analysis of the urine; toxicology: chemistry of carbon compounds.

Lectures and recitations. 1 hour a week, first semester; 2 hours a week, second semester, second year. PROFESSOR BELL.

Laboratory work; analysis of the urine. 6 hours a week, second year, from October 1st to January 1st. PROFESSORS BELL AND CAREL.

Courses I, II and III in chemistry, in the school of technical and applied chemistry, are accepted in place of first year chemistry in the department of medicine.

See statement of fees, page 18.

An optional course in experimental work is given during the second semester of the second year.

It includes work in toxicology, water analysis, food analysis, and the preparation of carbon compounds, according to the wishes and needs of the individual student.

No charge is made except for apparatus destroyed.

Chemistry.

Second year—

Tyson's Examination of Urine.

Reese's Toxicology.

PATHOLOGY AND BACTERIOLOGY.

The laboratories of pathology and bacteriology occupy spacious quarters in the laboratory of medical sciences. A general laboratory, 44x70 feet, is well lighted by windows on three sides and part of the fourth. Electric light for microscopic and general illuminating purposes is also provided. The arrangement is such that four students are grouped so as to have a sink with gas, water and waste connection, and ample desk space next the windows. Eight lockers, arranged beneath the table and on the walls, provide for apparatus, microscopes, etc., and are given at the beginning of the course to each student. Immediately behind and accessible to each student, are sterilizers, incubators, blow pipes, etc. Cupboards, drawers, a large incubator, sinks, fume chambers, demonstration and distribution tables, complete the arrangement of the room.

Two private rooms of the demonstrators flank it on either side. Adjoining one of these are the department library and the office and private laboratory of the professor of pathology and bacteriology. Adjoining this is the private laboratory of the professor of surgical and clinical pathology. Specimens illustrative of surgical pathology are here prepared and diagnostic work done.

In the basement of the building, the department has store rooms and a room where pathological animals are housed. Here too are equipped laboratories for research in bacteriology and experimental pathology, as well as a room in which all the culture media are made.

In the third story, immediately above and of the same size as the large laboratory, is a museum for the storage and exhibition of pathological specimens, while a preparation room for their reception and assorting adjoins it.

The hospitals of Minneapolis and St. Paul afford a large supply of material and frequent opportunities for post-mortem examinations.

MICROSCOPES.

An adequate equipment of microscopes with attachments, immersion lenses, etc., permits of the rental of an instrument to each student, a a cost of $2.00 per semester, whenever he is unprovided with one suitable for his purposes.

Course I (a) Bacteriology.

Lectures and demonstrations. This subject will be treated not only from the aspect of pathology, but in its relation to hygiene and public health. The general scope of bacteriology, the classification of the various bacterial forms, the composition and manufacture of culture media, the methods of isolation and culture, the testing of various bactericidal materials, conditions, etc., will be studied until a thorough knowledge of technique is acquired, (so far as may be possible with non-pathogenic bacteria.) The special study and comparison of the various pathogenic micro-organisms will then be systematically taken up, 2 hours per week, first semester, third year.

PROFESSORS WESTBROOK AND WHITE AND DR. WILSON.

b) *Bacteriology.* Laboratory work, teaching the general principles of and familiarization with the making of culture media, the methods of culture isolation and the microscopic examination of stained and living bacteria, the testing of various antiseptics, etc

The student will be required to cultivate in the various media, for macroscopic and microscopic examination, all the important pathogenic bacteria, such as the pyogenic bacteria, B. anthracis, B. typhi abdominalis, B. coli communis, Vibro choleræ, B. diphtheriae, B. tuberculosis, etc. Materials and tissues from men and animals, containing these and other bacteria, will be provided for diagnosis and the isolation of the bacteria in pure culture, where practicable. Parallel study of micro-organisms which might be mistaken for these, will also be pursued. Bacteriological diagnosis, in its relation to clinical diagnosis and public health, will be especially dwelt upon. 9 hours a week, for the first twelve weeks of the first semester, third year. PROFESSORS WESTBROOK AND WHITE AND DR. WILSON.

Course II. (*a*) *General pathology.*

Lectures, demonstrations and laboratory work on the general processes involved in disease. Bacteriology and its etiological relation is taught concurrently (see above). The general consideration of tumors will be omitted, since it is fully dealt with in the course on surgical pathology and special pathology. 2 hours a week, first semster, third year.

(*b*) *General pathology.*

Laboratory work, particularly on the history of inflammation, (largely experimental) degenerations, etc. Nine hours a week for four weeks at the end of first semester, third year. PROFESSORS WESTBROOK AND WHITE AND DR. WILSON.

Course III. (*a*) *Special pathology.*

Lectures and demonstrations. The special study of the pathological processes occurring in the blood, vascular and lympathic systems, lungs, liver, kidneys, alimentary canal, etc., will be taught by the demonstrations of fresh tissues and preserved specimens from the pathological museum. Three hours a week, second semester, third year. PROFESSORS WESBROOK AND WHITE.

(*b*) *Special pathology.* Practical laboratory work, in which the students will be required to mount and examine, under the microscope, selected, fresh and stained specimens of morbid tissues, fluids, etc. The microscopic and chemical study of such materials as pathological blood, sputum, urine, contents of alimentary canal etc., and the application of laboratory methods to clinical diagnosis will form an important part of this work and will be taken up at the completion of the study of the morbid condition in each organ of the system. The animal parasites will also receive attention. The histology of the various tumors will be fully given and students wlll be provided with specimens for staining, mounting and examination. Nine hours a week, second semester, third year.

PROFESSORS WESBROOK AND WHITE, DRS. HEAD AND WILSON.

(*c*) *Special pathology.* Autopses and post-mortem technique. Students will have an opportunity of personally taking part in this work, under the direction of the pathologist in charge, in the hospitals of Minneapolis and St. Paul. A knowledge of the technique of post-mortem work and of morbid anatomy will be thus afforded. Throughout the third and fourth years.

PROFESSOR WHITE AND DR. ROTHROCK.

TEXT-BOOKS AND COLLATERAL READING.

The following text-books are preferred by the faculty. Reference works are suggested also, for collateral reading.

Medical dictionaries;

Dorland's Illustrated Medical Dictionary.
Gould's Medical Dictionary.
Dunglison's Medical Dictionary.
Duane's Medical Dictionary.

Histology.

First year.
- Wilson's The Cell.
- Piersol's Histology.
- Böhn-Davidoff-Hube's Histology.
- Stöhrs Histology.
- Quain's Anatomy, 10th Ed. Vol. I, Pt. II.
- Schæfer's Histology.
- Parker's Biology.

Second year.
- Piersol's Histology.
- Quain's Anatomy, Vol. III Pts. I, III and IV.

Collateral reading—Kölliker's Gewebelehre Pts, I and II; Duval's Précis d' Histologie; Ranvier's Traite d' Histologie; Weyesse's Histology; Behren's Kossel u Schiefferdecker's Gewebelehre; Klein's Histology; O. Hertwig's The Cell; Lee's Microtomist's Vade Mecum; Stirling's Practical Histology; Willey's Amphioxus, etc.; Thomson' Zoölogy; Huxley & Martin's Biology; Davenport's Experimental Morphology.

Embryology.

- Minot's Embryology.
- Hertwig—Mark's Embryology.
- Marshall's Vertebrate Embryology.

Collateral reading — Kölliker's Enlwicklungsgeschichte; Prenant's Embryologie Schenk's Embryologie; O. Schultze's Embryologie; Heisler's Embryologie.

Anatomy.

First year—
- Morris' Text Book of Human Anatomy
- Quain's Anatomy, 10th edition, Vol. II, Pts, I and II.
- Gray's Descriptive and Surgical Anatomy.
- Gerrish's Anatomy.

Second and third years—
- Quain's Anatomy, 10th edition.
- Morris' Text-Book of Anatomy.
- Gerrish's Anatomy.
- Gray's Anatomy.
- Spatschatz Atlas of Human Anatomy.
- Holden's Practical Anatomy.
- Erdmann's Manual of Dissections of the Human Body.
- Weiss' Practical Anatomy.
- Hayne's Manual of Anatomy.
- Owen's Manual of Anatomy.
- Holden's Manual of Dissections.
- Treve's Applied Anatomy.

Collateral reading—Flower's Osteology of Mammals; Gegenbauer's Elements of Comparative Anatomy; Chauveau's Comparative Anatomy; Wiederscheim's Elemenis of Comparative Anatomy; McClellan's Regional Anatomy; Meynert's Psychiatry. Part I: anatomy, physiology and chemistry of the brain; Deavers' Surgical Anatomy.

Physiology.

First and second years—
- Foster's Physiology, sixth edition.
- Howell's American Text-Book of Physiology.
- Stirling's Practical Physiology.
- Waller's Human Physiology.

Collateral reading—Landois and Stirling's Handbook of Physiology; Chapman's Physiology; Stewart's Practical Physiology; Yeo's Physiology; Blyth's Foods.

Chemistry.

Second year.

Tyson's Examination of Urine.

Reese's Toxicology.

Materia medica and therapeutics.

First year—

Pharmacopœa of the American Institute of Homeopathy.

Second year—

Hughes' Pharmaco-Dynamics.

Third and fourth years.

Materia Medica Manual—Fahnestock.

Farrington's or Cowperwaite's Materia Medica, Hahnemann's Organon.

Reference books—third and fourth years—Allen's Hand Book, Herring's Condensed Materia Medica, Dunham's Lectures.

Pathology.

Ziegler's General and Special Pathology.

Stengel's Text-book of Pathology.

Coats' Manual of Pathology.

Mallory and Wright's Pathological Technique.

Collateral reading—Hamilton's Text-book of Pathology; Delafield and Prudden's Handbook of Pathological anatomy and Histology; Woodhead's Practical Pathology; von Kahlden's Pathological Histology; Thoma's Text-book of General Pathology; Lubarsch Ostertag, Ergebnisse der Pathologie u Anatomie, Orth, Pathologische Anatomie; Birch-Hirschfield, Pathologische Anatomie; Clifford Allbutt's System of Medicine, Vol. I; Leukhart's die Thierische Parasiten des Menschen, Bouchard, Traite de Pathologie General. Eichorst, Pathologie u Thempil; Barton's General Pathology.

Clinical Microscopy.

Von Jaksch's Clinical Diagnosis.

Simon's Clinical Diagnosis.

Cabot's Clinical Examination of the blood.

Cabot's Serum Diagnosis of Disease.

Collateral reading—Lenhartz Mikroscopie u Chemie am Krankenbett; von Limbeck Klinische Pathologie der Blutes.

Bacteriology.

Muir and Richie's Manual of Bacteriology.

Abbott's Principles of Bacteriology.

Abbott, The Hygiene of Transmissible Diseases.

Park, Bacteriology in Medicine and Surgery.

Collateral reading—Sternberg's Manual of Bacteriology; Fraenkel's Bacteriology; Woodhead's Bacteria and their products; Duflocq, Lecons sur les Bacteries Pathogenes; Flügge, die Mikroorganismen; Lehmann and Neumann, Atlas u Grunnriss d, Bakteriologue u Lehrbuch d, spec. Bakteriolog, Diagnostik; Migula, System de Bakterien; Duclaux, Traité de Microbiologie. Hueppe (Jordan) Principles of Bacteriology, Norg Laboratory Work in Bacteriology.

Practice of Medicine.

Goodno's Practice.

Raue Therapeutics.

Lippe's Repertory.

Knerr's Repertory.

Pepper's System of Medicine.

DaCosta's Diagnosis.

Anders' Practice of Medicine.

Physical Diagnosis.

Lilienthal's Therapeutics.

Lippe's Repertory.

Farrington's Clinical Materia Medica.

Vierodt's Medical Diagnosis.
Abrams' Manual of Clinical Diagnosis.
DaCosta's Diagnosis.

Surgery.
Park's Surgery.
Homeopathic Text-book of Surgery.
Moulin's American Text-book of Surgery.
Bradford & Lovett, Orthopaedic Surgery.
Pye's Surgical Handicraft.

Skin and Genito-urinary Diseases.
Skin—Kippax, Hyde, Pye-Smith.
Genito-Urinary—Doughty, Carlton.

Obstetrics.
Leavitt.
Lusk's Midwifery.
American Text-book of Obstetrics.
American System of Obstetrics.
Grandin & Jarman's Midwifery.
Playfair's Midwifery.
Boisliniere, Obstetric Accidents,
Davis' Obstetrics.

Gynecology.
Wood, Text-book of Gynecology

Ophthalmology.
Norton, Buffum, Swanzy, Noyes.
Collateral reading—Fuch's Diseases of the Eye.

Otology and Rhinology.
Ear; Barr.
Nose and Throat; Kyle, Bosworth, Ivins, McDonald.
Nose, Throat and Ear; Veshlaget & Hallett, McBride, Burnett.

Nervous and mental diseases.
Talcott's Mental Diseases.
Clouston Mental Diseases.
Edinger's Anatomy of Central Nervous System.
Martin's Nervous Diseases.
Dana Text-book Nervous Diseases.
Bigelows' System of Electro-therapeutics.
Oppenheim Diseases of the Nervous System.
Collateral reading—Hack Tuke's Dictionary of Psychological Medicine; Bevan Lewis' Mental Diseases; Kirchoff's Handbook of Insanity; Ferrier's Localizations of Cerebral Diseases; Strumpell's Text-book of Medicine; Hirt's Diseases of the Nervous System; Horsley's Brain and Spinal Cord.

Diseases of Children.
Tooker's Diseases of Children.
Holt's Diseases of Children.
Fisher's American Text-book of Diseases of Children.
Collateral reading—Cyclopedia of Diseases of Children.

Hygiene.
Coplin and Bevan's Practical Hygiene.
Park's Hygiene.
Collateral reading—Richardson's Preventative Medicine; Buck's Hygiene and Public Health.

Medical jurisprudence.
Taylor's Medical Jurisprudence.
Chapman's Medical Jurisprudence.
Collateral reading—Hamilton's American System of Legal Medicine; Withaus' and Becker's Medical Jurisprudence and Toxicology; Wharton and Stille's Medical Jurisprudence.

All communications pertaining to the college of homeopathic medicine and surgery should be addressed to the Dean, A. P. Williamson, M. D., No. 602 Nicollet Avenue, Minneapolis, Minn.

The College of Dentistry

FACULTY

CYRUS NORTHROP, LL. D., *President.*

WILLIAM P. DICKINSON, D D. S., Andrus Building, *Professor of Materia Medica and Dean.*

THOMAS E. WEEKS, D. D. S., 501 Dayton Building. *Professor of Operative Dentistry and Crown and Bridge-Work.*

THOMAS B. HARTZELL, M. D., D. M. D., 9 Syndicate Block. *Professor Pathology Therapeutics and Oral Surgery.*

OSCAR A. WEISS. D. M. D., 506 Masonic Temple. *Professor of Prosthetic Dentistry and Orthodontia.*

ALFRED OWRE, D. M. D., M. D., C. M., 401 Masonic Temple, *Professor of Metallurgy and Clinical Professor of Operative Dentistry.*

CHARLES A. ERDMANN, M. D., 802 Dayton Building. *Profossor of Anatomy.*

RICHARD O. BEARD, M. D., 812 Dayton Building. *Professor of Physiology.*

CHARLES J. BELL, A. B., University of Minnesota. *Professor of Chemistry.*

H. C. CAREL, B S., *Assistant Professor of Chemistry.*

THOMAS G. LEE, A. M., M. D., University of Minnesota. *Professor of Histology and Embryology.*

WINFIELD S. NICKERSON, Sc. D., *Assistant Professor of Histology.*

FRANK F. WESBROOK, M. A., M. D., C. M., 328 Tenth Ave. S. E., *Professor of Bacteriology and Pathology.*

S. M. WHITE, B. S., M. D., *Assistant Professor of Bacteriology and Pathology.*

FRANK R. WRIGHT, D. D. S , M. D., 403 Dayton Building, *Lecturer on Anæsthesia and Chief of Anæsthetic Clinic.*

MARY V. HARTZELL, D. M. D., 9 Syndicate Block, *Instructor in Dental Anatomy.*

H. M. REID, D. D. S., 423 Medical Block, *Instructor in Prosthetic Dentistry.*

CHARLES A. VAN DUZEE, D. D. S., St. Paul, *Instructor in Operative Dentistry.*

E. FRANKLYN HERTZ D. M. D., Andrus Building, *Instructor in Prosthetic Dentistry.*

JAMES O. WELLS, A. M., D. M. D., Masonic Temple, *Instructor in Crown and Bridge Work.*

MARGARET L. NICKERSON, M. A., *Instructor in Histology.*

H. K. Read, M. D., *Demonstrator of Anatomy.*

M. RUSSELL WILCOX, M. D., *Demonstrator in Physiology.*

Announcement.

The College of Dentistry of the University of Minnesota offers a progressive course of study which covers three terms of nine months each, in three separate calendar years. Classes are graded as first, second and third year. Students who successfully pursue this course are given the degree D. M. D. (doctor of dental medicine). which entitles them to come before any state board of dental examiners for a license to practice dentistry in that state.

The central idea upon which this institution was founded, is that dentistry is a branch of the healing art, and that the practitioner should posess a medical education, hence the curriculum has been broadened so as to include the fundamental principles that underlie the practice of medicine. In this connection special attention is called to the fact that while a thorough course is required, practical work is not neglected. The technical courses are very complete and the clinical facilities are unsurpassed.

Another special feature of this institution is that in laboratory work and infirmary practice, students at all times operate under competent instructors, the professors themselves serving as demonstrators, and every stage of each operation receives due criticism and marking.

Courses of Instruction.

FIRST YEAR.

ANATOMY.

Osteology. Lectures and recitations, covering a thorough study of the human skeleton, and supplementary work on the osteology of domestic mammals; three hours each week for ten weeks of the first semester. Laboratory work on the human skeleton; class in sections, two hours each section, for ten weeks, first semester.

Syndesmology. Lectures, recitations and laboratory demonstrations. Three hours each week, for four weeks, first semester.

Myology. Lectures and recitations, covering the entire muscular system of the human body with supplementary study of comparative myology; three hours each week, sixteen weeks. Laboratory work consists of identifying the muscles of the human body on dissected preparations and showing their actions. Class in sections, four hours each week, for five weeks. Also attendance upon lectures on descriptive, topographical and surgical anatomy, two hours per week.

Text-book required—Quain's Anatomy, tenth edition, Vol. II, parts 1 and 2, or Morris' Anatomy.

DENTAL ANATOMY.

The subject is taught by a thorough laboratory course, in which the student studies the teeth by dissection, modelling, carvings and drawings. In the study of dental anatomy, human and comparative, the definition, terminology, notation, form and arrangement of the teeth will be fully considered; also macroscopic and microscopic characteristics of sections, including the study of the relation of enamel to dentine and of the pulp canal.

In the study of structural anatomy, teeth will be selected and mounted upon wooden blocks. They will be filed down until the pulp chamber and canals are exposed, and drawings from actual measurements of the different aspects will then be made and carefully studied. Opportunity for the study of microscopic sections and lantern slides will also be afforded. The didactic instruction will be illustrated by "chalk talks," lantern slides, lectures, heroic models and skulls.

The standing of the student will be determined by marks given on the cutting of sections, models, drawings, and recitations. Lectures and recitations, covering the influence of form and arrangement of the teeth upon caries, will also be given.

Text-book required—Black's Dental Anatomy.

Collateral reading—American Text-book (Thompson;) Comparative Dental Anatomy—(Thompson;) Dental Anatomy, Human and Comparative (Tomes'.)

PHYSIOLOGY.

The subject is taught by recitations and lectures illustrated by practical demonstrations. These embrace the discussion, and, as far as possible, the observation of physiological ingredients of the animal body; of the physiology of cell life or the fundamental properties of the cell; the nutritive media, blood, lymph and chyle; of the elementary functions of the nervous system; of the muscular tissues, and the epithelial tissues; of the vascular mechanism; of the alimentary canal; of the organs of secretion, excretion and respiration.

Text-book required- Foster's Physiology.

HISTOLOGY AND EMBRYOLOGY.

This course will consist of lectures, recitations, laboratory work and demonstrations and will include a study of the structure and properties of protoplasm; the cell, its structure and properties, cell division, reproduction, ovum, spermatozoon, and formation of blastoderm. A study of the structure and life history of certain type-forms of unicellular animals and plants, as amœba paramœcium yeast, spirogyra, etc., simple metazoa, as hydra, etc.; a consideration of the structure of vertebrates; the tissues, as epithelium, connective tissue. cartilage bone, etc., muscle, nerve, blood and lymph; vascular and lymphatic system. The teeth, enamel, dentine, cementum, pulp, etc. A general outline of the development of the embryo; the formation of the head; development of the jaws, teeth, oral cavity, glands, etc,

First semester, recitations, four hours per week; laboratory, six hours per week.

Text-book required—Stohrs' Histology.

CHEMISTRY.

(*a*) Lectures on the chemistry of the elements.

(*b*) Laboratory work in general inorganic chemistry of non-metallic and metallic elements.

(*c*) Lectures on qualitative analysis with special attention to the examination of alloys.

(*d*) Laboratory work corresponding to course (*c*) and including the qualitative determination of bases and acids. In this course several alloys are analyzed by each student.

(*e*) Recitations are carried on throughout the year to test the individual knowledge of each student.

(*f*) Optional courses are offered in quantitative analysis, water analysis, etc.

Text-books required—Inorganic Chemistry Syllabus and Laboratory Notes on Qualitative Analysis, prepared by the department.

PROSTHETIC DENTISTRY.

The work in this year is entirely technical and includes the consideration of impression materials of different kinds and their properties; taking impressions, making casts and models; making upper and lower retaining plates for a fellow student's mouth; after which the upper is broken and repaired; making partial upper plate with rubber base, comprising the making of trial plate, taking bite, mounting case in articulator, grinding and arranging teeth for proper articulation, flasking, packing, vulcanizing and finishing. Making full upper and lower sets of teeth upon rubber base, using plain teeth and arranging same in accordance with the Bonwill law of articulation; making full upper and lower swaged metal plates, comprising the making of models, molding in sand, casting dies and counter-dies; swaging plate to fit model, soldering rim and grinding and polishing metal. Making lower cast-metal plate, comprising the making of models and moulds, casting and polishing.

SECOND YEAR.

ANATOMY.

Splanchnology.

Descriptive and topographical anatomy of the thoracic viscera, the alimentary and urino-genital organs. Lectures and recitations, 3 hours each week, for 10 weeks.

Descriptive and Surgical Anatomy.

Head, neck, trunk and extremeties. Lectures and recitations, 3 hours each week, for 12 weeks.

The Nervous System.

Cerebro-spinal axis and its membranes; the cranial and spinal nerves; the sympathetic nervous system; and the special-sense organs. Lectures and recitations, 3 hours each week, for 8 weeks.

Text Books Required.

Morris' Anatomy. Edinger's Anatomy of Brain and Cord.

Dissecting. The work extends over a period of eight weeks, requiring 15 hours each week. The dissection of the entire human body is required. The method of work follows that laid down in Holden's Manual of Dissections.

MATERIA MEDICA AND THERAPEUTICS.

Pharmacology. This course includes the study of the general characteristics of drugs and their physiological action, with a comprehensive classification and description of remedies employed in dentistry. Lectures, recitations and laboratory work.

Therapeutics. This course is given by lectures and recitations, and clinically. The student being instructed in the special therapeutics of dental and oral diseases; systemic treatment, in cases requiring it, receives due consideration. New remedies that give promise of value are fully studied and put to practical test in the infirmary, under direct supervision. Antiseptic and disinfectant methods, as well as dental hygiene, also receive due attention.

PATHOLOGY.

The instruction in this branch will begin with a consideration of the terminology belonging to the subject, followed by the presentation of the lesions of inflammation, local and general, and the degenerate changes in the tissues.

The general character of tumors, practical consideration of pathological detention, pyorrhœa alveolaris, pulpitis, pulp nodules, secondary dentine, pericementitis, alveolar abscess, caries of jaw, and necrosis dependent on a diseased condition of the teeth, the various inflammations of the oral cavity, including syphilis and tuberculosis, will all receive due attention.

Text-book required—Burchard.

OPERATIVE DENTISTRY.

Didactic. Lectures and recitations illustrated by lantern slides, charts, heroic models and physical apparatus will be given on cavity classification and nomenclature, instrument nomenclature and instrumentation, removal of deposits, rubber dam and exclusion of moisture; cavity preparation, the enamel in its relation to cavity margins; sensitive dentine and pulp treatment; conservative and radical, including discoloration, its cause and treatment; canals, their cleansing and filling; matrices; separating teeth and correcting interproximate space; preparation and insertion of filling materials, including inlays; finishing fillings; clinical operations in their relation to vital tissue, including a a review of the technic of conservative operations; the conduct of a practice.

Both junior and senior classes attend these lectures and stand quiz. The questions to each class vary according to their work. An examination will be held at the close of each subject.

Technical. The course of technics which is given at the beginning of this year includes the formation of typical cavities in plaster models, vulcanite and ivory teeth; Protecting nearly exposed pulps, and capping exposed pulps; gaining access to canals; cleansing and filling canals with various materials, subsequently examining them to note results; application and retention of the rubber dam; preparing and inserting the various filling materials, gutta percha, cements, amalgams, tin and gold. *This work must be completed in the first semester.*

Clinical. Students enter the infirmary at the beginning of the second semester *if their technic work is complete.* No student will be assigned patients until his work is completed.

Before beginning work upon patients, students are given an "infirmary drill" in which they are taught to meet patients, adjust the chair, make examinations, remove deposits and cleanse the teeth, and to apply the rubber dam. In the Infirmary, students are under the immediate supervision of the instructors of this branch, who teach them how to diagnose, treat, and prognose cases, beginning with those requiring the simplest service and progressing as their skill increases. This intimate association of the technical and clinical enhances the value of the former and facilitates progress in the latter. Each operatton is first presented to the student by a demonstration given by the instructor.

Text books required. American Text Book Operative Dentistry. Reference, Johnson's Principles and Practice of Filling Teeth.

PROSTHETIC DENTISTRY.

Didactic. Lectures and recitations will cover the various bases used in mounting artificial teeth, their characteristics and preparation, porcelain teeth, their composition, form and color as related to the several temperamental types and their forms as adapted to the various kinds of bases. The preparation of the mouth for artificial dentures, and various methods in use for their retention will be fully considered.

Technical. Making upper swaged plate of german silver, mounting plain teeth thereon to articulate with model of lower natural teeth. Making upper combination swaged metal and rubber plate, mounting gum-section teeth thereon to articulate with lower cast metal plate. Making partial lower swaged metal plate with reinforcement and clasps. Making partial upper swaged metal plate with teeth attached by soldering. Making lower cast metal plate. casting metal around lingual side of teeth and forming gum upon labial and buccal sides with pink rubber. Making lower swaged aluminum plate with turned rim.

Clinical. The student enters the infirmary this year upon completion of the technic course, and puts into practice the principles there acquired.

Text-book required. Essig's American Text-book of Prosthetic Dentistry.

ORTHODONTIA.

The work in this year is technical and includes a consideration of material for regulating appliances. German silver, its properties, annealing and tempering; drawing wire, making tubing and band material, constructing bands with screw; jack-screws of different forms, rotation and expansion appliances, retractors and retainers.

The properties of steels, forging, hardening, tempering and polishing, the making of excavators and chisels, band drivers, band removers and wrenches or keys. Making taps for threading nuts, etc. Each operation is performed by the student after a demonstration by the teacher.

Text-book required. Guilford's Orthodontia.

CROWN AND BRIDGE-WORK.

Didactic. The work of this year is didactic and technical. Lectures and recitations will cover the preparation of roots for gold, porcelain and porcelain-faced crowns. The principle of construction and attachment of the various kinds of crowns and bridge-work will be fully taught.

Technical. Preparing root for post, grinding, setting porcelain crown without band. Preparing root for porcelain crown with band, measuring root, making band to fit same. Construction of the crown. Gold shell crown, making band, swaging, reinforcing and fitting cap, assembling, soldering, finishing and setting upon root. Making cap and post for porcelain-faced crown, grinding, fitting, backing and attaching face to cap, finishing and setting upon root. Making gold and porcelain-faced dummies and assembling the same with crown to form a bridge.

Text-books required. Essig's American Text-book of Prosthetic Dentistry.

THIRD YEAR.

BACTERIOLOGY AND PATHOLOGY.

Bacteriology. Lectures, recitations and laboratory work, a short general survey of the problems brought to light by bacteriology, and general methods and technique involved, will be followed by special study of certain microörganisms, such as pyogenic cocci, B. tuberculosis, B. Diphtheriae, etc. These studies will be pursued by means of actual cultivation on the various media, the making and examination of microscopic preparations of pure cultures, and both cultivation from and microscopic examination of infected tissues and fluids of the body, by the students themselves.

Text-book. Muir & Ritchie.

Pathology. Lectures, recitations and laboratory work. Special study of inflammations and the histological changes occurring in the tissues and fluids, constitutes the major portion of this course. Some attention is given to the degenerations and the subject of tumors with special reference to the face and oral cavity. Students prepare and examine many of the specimens and receive loan slides of the rarer types, or those difficult of preparation.

ORAL SURGERY.

The subject of oral surgery will be taught clinically and didactically. The large amount of clinical material presenting at the infirmary, furnishes ample opportunity for practical demonstration. Students are required to take charge of cases and carry them through under the advice of the instructor in charge. The didactic lectures will include a full consideration of all the surgical lesions of the oral cavity and associate parts, including oral tumors and the reflex neuroses connected with the fifth pair of nerves; fractures of the maxillæ; cleft palate and hare-lip; caries and necrosis of the jaws from constitutional causes; adenoid growths and nasal polypi in their relation to oral surgery; suppuration of the antrum; ulitis; epulic growths; fungoid pulp; ranula; exostosed teeth; ankylosis and dislocations, implantations, obturators, interdental and other forms of dental splints.

Arrangements have been made with several clinicians connected with the different hospitals of the city to give special clinics. An abundance of material representing all the different forms of diseased conditions of the mouth and associate parts is to be found in the infirmary service, which will be assigned to students for treatment under direction of the professor of oral surgery.

Clinical lectures on the cases presenting will be given from time to time. These cases include alveolo-dental abscesses; caries and necrosis of the maxillary bones; diseased condition of the antrum; pyorrhœa-alveolaris; dislocations and ankylosis; facial neuralgias; tumors of the mouth and associate parts; hare-lip, cleft-palate; implantation cases and fractures.

Text-book required. Marshall's Oral Surgery.

ORTHODONTIA.

Didactic. Lectures and recitations upon the classification of irregularities of the teeth etiology, local and constitutional, evils arising from, various systems of appliances used in treatment of; materials and details of their construction.

Clinical, In this year an ample clinic affords opportunity for each student to treat cases of irregularity. He will be allowed to use such of the technical material, which he has constructed, as is necessary. The correction of at least one case is obligatory.

Text-book required. Guilford's Orthodontia.

OPERATIVE DENTISTRY.

Didactic. The lectures on operative dentistry are delivered to both second and third year classes. All will be required to attend and to stand "quiz." The questions to the senior class will bear more upon the application of principles in practice. An examination will be held at the conclusion of each subject.

Clinical. Many clinics demonstrating advanced operations and peculiar methods are given in this year. The student has ample opportunity to put these methods into practice; he will also give special attention to the different forms of pathological lesions that pertain to daily office practice, and will carry cases to completion, including the restoration of the teeth to usefulness by filling, crowning or bridging, as the case may require. All operations will be marked and the record so made, together with a written examination on the didactic work, will form the final test in this branch.

Text-book required. Kirk's Operative Dentistry.

Reference. Johnson's Principles and Practice of Filling Teeth.

PROSTHETIC DENTISTRY.

Didactic. Lectures and recitations on obturators, their application and construction continuous-gum work and its application and construction, *Technical.* The construction of vulcanite and metal plates employing the various methods of rigid retention, and the construction of continuous-gum plates.

Clinical. In this year the student does the more complicated operations of this branch. The rarer cases which appear in the clinic are all utilized to the advantage of the entire class.

Text-book required. Essig's American Text-Book of Prosthetic Dentistry.

METALLURGY.

Didactic. This subject will be treated in the following order: Metallurgical terms processes, and the principles upon which they are based; the various metals and their ores; process of extraction and refining; their properties and application in the arts, especially in dentistry; alloys, general, and those used in dental amalgams. Lectures and recitations once a week throughout the year, written quizzes monthly.

Technical. Refining of gold and silver, producing pure metals from scraps and filings. Making alloys for plate, crown and bridge-work, solders and alloys for dental amalgams.

Special attention is given to the melting, casting, cutting, annealing and testing of dental amalgam alloys. Each student will be required to provide metal scraps for refining and metals for amalgam alloys, with which to produce by the processes named, metals and alloys which shall be retained by him for future use.

Text-book required. Hodgen's Practical Dental Metallurgy.

CROWN AND BRIDGE-WORK.

Technical. The construction of porcelain crowns and bridges, and crowns with attachments for the rigid retention of the same.

Clinical. The student in this year will perform practical operation in the mouth, covering all forms of crown and bridge-work.

Text-book required. Essig's American Text-book of Prosthetic Dentistry.

PHYSICAL DIAGNOSIS AND ANÆSTHESIA.

The subject of physical diagnosis will be taught didactically and practically, and will have direct bearing upon the subject of anæsthesia and will be as complete as its importance demands. A course of urinalysis will be given in connection with this course.

The technics of anæsthetics, both general and local, receive full consideration. All anæsthetics are administered in the clinic, and full instruction concerning their use is given. The members of the senior class are required, under direction, to administer them and extract teeth under these agents.

Text-books required. Tyson, Physical Diagnosis and Turnbull's Manual of Anæsthetics.

STUDENTS' DENTAL SOCIETY.

In this year a society is organized, which is under the direct supervision of the faculty, and is made a part of the course of instruction. Every third year student is required to prepare an original paper upon some dental, or allied topic, to be read before and discussed in open meeting. The meetings will be held every two weeks, and will commence the first week in October.

RECAPITULATION.

FIRST YEAR.

Anatomy—Lectures and recitation.
Physiology—Lectures and recitations.
Histology and embryology—Lectures and laboratory.
Chemistry—Lectures and laboratory.
Dental anatomy—Lectures and laboratory.
Prosthetic technics—Laboratory.

SECOND YEAR.

Anatomy—Lectures and laboratory.
Pathology—Lectures.
Materia medica—Lectures and laboratory.

Therapeutics—Lectures, recitations and clinical.
Operative dentistry—Lectures, technical and clinical.
Prosthetic dentistry—Lectures, technical and clinical.
Orthodontia—Technical.
Crown and bridge-work—Lectures, recitations and clinical.

THIRD YEAR.

Bacteriology and pathology—Lectures, recitations and laboratory.
Oral surgery,
Physical diagnosis, } Lectures and clinical.
Anæsthesia,
Orthodontia—Lectures, technics and clinical.
Operative dentistry—Lectures and clinical.
Prosthetic dentistry—Lectures, technical and clinical.
Crown and bridge-work—Technical and clinical.
Metallurgy—Lectures and technical.
Students' Dental Society.

GENERAL INFORMATION.

THE COLLEGE YEAR.

The fourteenth annual session of this college opens Wednesday, September 11th, 1901, and closes on Friday, May 30th, 1902.

The college year will be divided into semesters, the first ending January 25th, 1902. The succeeding week will be devoted to the midwinter examinations. The second semester begins February 4th. The lecture courses will close May 17th, when the final examinations of the year begin.

Practical work for both the senior and junior classes will continue until June 1st.

The technic and laboratory courses begin immediately upon the opening of the school, the classes being called Wednesday, September 11th. The lecture courses commence Tuesday, September 24th.

Commencement exercises will occur in common with the other departments of the University, on Thursday, June 5th, 1902.

All statements in this announcement as to courses of study, conditions, requirements or fees, have reference to or binding force only upon the session of 1901-1902, unless otherwise definitely stated.

QUALIFICATIONS FOR MATRICULATION.

The examination for admission commence Tuesday, September 3d, and will be conducted by a committee appointed by the president, from the college of science, literature and the arts, of the University.

Examinations are held only in the English language.

Information as to where the examinations are held, may be obtained in the registrar's office in the library building.

Prospective students should not fail to bring their credit certificates with them.

The requirements for the session of 1901-1902 are the same in amount, as for admission to the freshman class of the college of science, literature and the arts, and are as follows:

N. B.—Time element, as indicated with each subject, is essential.

A three years' course of reading in English classics.
English Composition, one year.
Algebra, elementary, one year.
Physics, one year.
Geometry, plane, one year.
Latin, two years.

In addition to the above named subjects, which are required, and for which substitutes cannot be accepted, applicants shall present evidence of preparation in six year credits, or their equivalent, to be chosen from the following list:

- **Latin.**
  - Cicero, six orations, one year.
  - Vergil, six books, one year.
- **Greek.**
  - Grammar, one year.
  - Anabasis, four books, one year.
- **German.**
  - Grammar, one year.
  - Literature, one year.
- **French.**
  - Grammar, one year.
  - Literature, one year.
- **English.**
  - Latin element, one year.
  - Literature, one year.
- **History**, Greece and Rome, one-half year.
  - England, one-half year.
  - Modern, one-half year.
  - Medieval, one-half year.
  - Senior American, one-half year.
- **Civics**, one-half year.
- **Political Economy**, one-half year.
- **Physiology**, one year.
- **Chemistry**, one year.
- **Botany**, one-half or one year.
- **Zoology**, one-half or one year.
- **Astronomy**, one-half year.
- **Geology**, one-half year.
- **Physiography**, one-half year.
- **Geometry**, solid, one-half year.
- **Algebra**, higher, one-half year.

I. Graduates of any Minnesota State high School will be admitted **without examination, provided—**

(1) That the school maintains a **full four-year course** of high school work.

(2) That the applicant present to the dean, the principal's certificate showing the satisfactory completion **of all the studies required for admission.**

II. Graduates of the **advanced courses of Minnesota normal schools** will be admitted upon the same terms as graduates of State high schools.

III. Any Minnesota high school or academy **not under supervision of the State High School Board,** but requiring for graduation **a four-years' course,** exclusive of the common school branches, conforming **essentially in the distribution of time** to the entrance requirements of this college, **may be accredited** in all respects as are the State high schools.

IV. Graduates from schools in other states, whose diplomas admit to **reputable colleges,** will be received, subject to the regulations that apply to graduates of Minnesota State high schools.

V. Diplomas to be accepted must be accompanied by certificates showing studies taken, and amount of time spent on each.

ENROLLMENT.

The last day of enrollment for the session of 1901–1902, will be Wednesday, September 11th.

Students will be assigned seats in order of, and at the time of their matriculation. Such matriculation and assignment of seats will be had in the office of the registrar of the University, in the Library building. Students will then present themselves for examination; or for the approval of their evidence of preliminary qualification. Having received an entrance certificate from this committee, they will report to the dean of the college for admission and classification.

Seats in the amphitheatre, laboratory benches and lockers, as well as chairs and lockers in the infirmary, are assigned to students in the order of their matriculation, and when so assigned must not be exchanged for others without permission and registration.

Lockers and drawers are provided for the convenience of students, but the college will not be responsible for any personal losses of students.

It is of the utmost importance to students, that as soon as possible after enrollment, their addresses in the city should be on file in the Dean's office. Telegrams and other urgent messages have failed of prompt delivery by reason of neglect of this request. It is just as important that changes in address should be on file.

ADVANCED STANDING.

Applicants for advanced standing must pass the entrance examinations or present the usual equivalents.

They must furnish satisfactory evidence of time spent and subjects covered in previous professional studies and must present themselves at the above dates and pass the examinations of all departments in which they wish to be exempt, if such examinations are deemed necessary by the professors in charge of the various departments.

All certificates pertaining to advanced standing must be presented to the dean who will send them to the respective professors for acceptance, or report of further requirements for acceptance.

No conditions of advanced standing will entitle the student to take the two years of any graded study coincidently.

Students will not be permitted to substitute private work in any branch for the regular college course work, excepting in the case of actual laboratory exercises done under the direct supervision of an instructor in the department, appointed by the chair and approved by the faculty. Examinations in such private laboratory work will be conducted by the chair.

Seniors in the college of science, literature and the arts who contemplate entering the department of medicine are permitted to elect courses in anatomy, histology and embryology, physiology and chemistry in this department in lieu of similar science courses in the college of science, literature and the arts. This election will be contributive toward the degrees given in both colleges. Reciprocally the college of dentistry accepts full courses, taken in the college of science, literature and the arts, in histology, physiology and chemistry in lieu of its first year's work in these branches

CONDITIONS.

Examinations of conditioned students and of applicants for advanced standing, in the common studies of the first and second year, are held in these branches, upon dates as published in the annual bulletin.

Students coming from other schools must make up their technic conditions under supervision of the instructors of this school, *at the convenience of the instructor.*

Conditions may also be removed at the close of each semester, at examinations held previous to the "mid-year," for this purpose.

No one can be classed as a junior or senior with more than two conditions.

Students will not be permitted to take advanced work in any graded study, until they have passed the lower branch, *e. g.*, materia medica and therapeutics.

Students will not be permitted to take examinations in the second year's work in any graded branch, until they have removed conditions in the first year's work of the same.

Students who carry conditions into a succeeding year may find a resultant conflict of study hours. In that event they will give preference to the unfinished studies of the lower or conflicting course.

No student will be eligible to final examinations in any year, who carries conditions of a previous year unremoved.

Candidates for graduation who carry conditions in studies of a previous year, must remove these conditions at the end of the first semester in order to be eligible for final examination.

Examinations of conditioned students and of applicants for advanced standing, in the common studies of the first and second years, will be held in these branches, upon the following dates:

September 18, 9 a. m.—Anatomy, first year.
September 18, 2 p. m.—Histology, first year.
September 19, 9 a. m.—{ Physiology, first year.
Anatomy, second year.
September 19, 2 p. m.—Chemistry, first year.

ATTENDANCE AND DISCIPLINE.

The college hours are from 8:30 a. m. to 12:30 p. m., and from 1:30 to 5:30 p. m.

Attendance upon all lectures, and infirmary and laboratory hours, as scheduled, is obligatory. A complete record of each student's attendance is kept, and all absences and tardinesses are noted.

All laboratory courses must be taken in full and must invariably be entered during the first week in which they begin.

Habitual absence, continued indifference to study, or persistently poor scholarship may subject the student to temporary or permanent suspension.

The practice of dentistry by students, except under the direct supervision of a preceptor, is prohibited by law in the state of Minnesota, and a rule of the National Association of Dental Faculties, to which this college belongs, reads as follows: "Students in attendance at colleges of this association are required to obey the laws regulating the practice of dentistry in the various states, and, failing to do this, shall not be again received into any college of this association." Any student detected in violating this rule will be suspended or expelled.

The connection of any student with this college may be terminated at any time, without a return of fees, whenever such action may be advisable on the ground of immorality or disorderly conduct. or a failure to conform to the established rules.

BREAKAGE AND LOSS.

A deposit of five dollars ($5.00) will be required in addition to the first semester fee, to cover loss of and breakage or damage to college property. This will be returned at the end of the year, providing there is no charge against the student. This fee is to be deposited with the accountant each year when the student matriculates.

In the chemical laboratory course, the student is assigned a certain amount of apparatus and material, for which a receipt is required.

For apparatus and material attaching to his laboratory desk, he is held responsible. At the end of each course, if such apparatus and material are restored in good condition, this receipt will be returned to him.

All apparatus lost or damaged in any laboratory, and all injury to, or destruction of university property, by any student, will be charged to him and must be paid for before he can receive credit for his course. A statement of these charges will be submitted to the accountant, and such breakage and loss fees will be deducted by him from the breakage and loss deposit.

In cases when the damage to college or university property cannot be placed upon an individual, or when the student is shielded by his class, the charge will be assessed to the class.

TECHNICS.

One issue for each piece of work will be made by the college, which, in case of failure, loss, damage or destruction, must be replaced by the student.

The completed work may be retained by the student, upon payment of cost of materials.

No student can take advanced work in operative dentistry, prosthetic dentistry or orthodontia, until the technic work of the branch is completed.

INSTRUMENTS, BOOKS, TOOLS AND MATERIALS.

All students are required to provide themselves with instruments, books, tools and materials as prescribed by the college. These can be obtained in the city, with the usual discount to students. The first installment must be procured and be approved by the instructor before seats can be assigned in the technic laboratories.

COLLEGE MUSEUM.

Members of the dental profession, and others interested, are invited to contribute pathological specimens, casts of malformations, irregularities of the teeth, models, charts, drawings, etc., which may be useful as illustrative matter in the lecture rooms.

ALUMNI ASSOCIATION.

An association of the graduates of the college has its annual meeting during commencement week.

CLINICAL FACILITIES.

The opporntuities for acquiring a practical knowledge of both operative and prosthetic procedures is unsurpassed, the material presenting in the infirmary clinic being more than ample for all purposes of instruction.

GRADUATION.

At the close of the third year, a student who has passed all examinations satisfactorily, receives the degree of Doctor of Dental Medicine (D. M. D.) upon the following conditions:

He must be twenty-one years of age.

He must have attended three full courses of instruction, the last of which must have been in this college.

He must have passed the full requirement in dissections and must have performed satisfactorily in the college all the required operations in operative and prosthetic dentistry.

Immorality, disorderly conduct, or a failure to conform to the rules of the college, will be deemed a sufficient bar to any student receiving his degree.

Under no circumstances are degrees *in absentia* conferred by this college.

No student will be recommended for graduation, except at the annual commencement in June.

Students failing to graduate will be required to pay a fee for completing unfinished work.

FEES AND EXPENSES.

The annual fee, which includes all charges for matriculation, lecture and laboratory courses, and dissections is, one hundred dollars, ($100.00.)

One-half of this fee will be payable when the student matriculates. The accountant's receipt for the portion will entitle the holder to take entrance examinations and to classify. The second half will be payable at the opening of the second semester. These receipts must be presented to, and countersigned by the secretary of the college, before entering upon the work of each semester.

There is no fee for diploma upon graduation.

A breakage and loss deposit of five dollars ($5.00) is required, when the fee for the first semester is paid.

If the applicant fails to pass the entrance examinations, his fee will be returned by the accountant.

In addition to the college fee, there is a rental fee of $2.00 for a microscope, in each semester when its use is required, provided the student is not supplied with a satisfactory instrument.

There is also a rental fee of $1.00 for microscope in the course of bacteriology in the third year. It is an advantage for the student to possess his own microscope, and assistance in the selection of one will be given when desired.

There are no free scholarships, and no students are received for less than the regular fee.

No student will be permitted to take final examinations until after all fees and charges have been paid.

After having entered upon the course of study, fees are not returnable, and no rebate will be recommended should a student discontinue work, but the faculty may recommend the application of a part to the succeeding year.

Senior students failing to graduate, will be required to pay a fee of ten dollars ($1.000) for each subject examined in, subsequent to the close of the session in which the failure occurred. A fee will also be charged for the completion of unfinished laboratory and practical work.

Rooms and board convenient to the college can be obtained at prices ranging from $3.00 to $5.00 per week, according to accommodations.

Furnished rooms without board, from $5.00 to $10.00, and unfurnished rooms from $4.00 to $7.00 per month.

A list of rooms and boarding places is kept by the secretary of the University Y. M. C. A., to whom inquiries or applications may be addressed.

From one hundred and fifty to one hundred and seventy-five dollars are necessary to defray the expenses of the first month. These include tuition, for first semester, board and room for the month, and books, instruments, tools and materials for the year, which must be purchased before commencing work. In order to avoid embarassment the student should bring sufficient funds to cover these first expenses.

For blank forms, relating to admission, or further information, address Dr. W. P. Dickinson, Andrus Building, Minneapolis, Minn.

The College of Pharmacy.

THE FACULTY.

Cyrus Northrop, LL. D., *Presikent.*
Frederick J. Wulling, B. S., Ph. G., Phm. D., LL. B., *Dean; Professor of Pharmacology, Pharmaceutical Chemistry and Pharmacal Jurisprudence.*
Henry M. Bracken, M. D., *Professor of Materia Medica.*
....*Profesoor of Pharmacognosy.*
Charles J. Bell, A. B., *Professor of Chemistry General, Medical, Analytical and Organic.*
Conway MacMillan, M. A., *Professor of Botany.*
Edward M. Freeman, B. S., *Instructor in Botany and Practical Pharmacognosy.*
Frank F. Wesbrook, M. A., M. D., .C M., *Professor of Bacteriology.*
George B. Frankforter, M. A., Ph. D., *Professor of Organic Chemistry* (Post-graduate)
George D. Head, B. S., M. D., *Instructor in Clinical Microscopy.*
Richard O. Beard, M. D., *Professor of Physiology.*
M. Russell Wilcox, *Instructor in Physiology.*
John F. Fulton, Ph. D., M. D., *Professor of Hygiene.*
F. A. Kiehle, A. B., *Instructor in Medical and Pharmaceutical Latin.*
....*Instructor in Mineralogy.*
B. O. Leubner, Phm. D., *Instructor in Pharmacy,*
H. C. Carel, B. S., *Instructor in Chemistry.*
....*Instructor in Materia Medica.*

ANNOUNCEMENT.

In the organization of this college the Board of Regents has aimed to secure the cooperation of the pharmacists ot the state. The character of instruction is of high order and every effort is made to comply with the demands of the profession in the Northwest, or elsewhere, in the maintenance of a course of instruction of the highest grade. The college is located on the University campus, in the new building, and is one of the colleges of the department of medicine, but is distinct in the government of its affairs. The new building and laboratories are on a par with the best in the country, and their equipment is complete.

The work of the college, as outlined in the following pages, is conducted by means of lectures, quizzes and laboratory exercises. Students will find their time fully occupied. The work is of such a nature that no student can accomplish it in the short term of five or six months. Students who may feel unable to complete the work in two years may divide it in a manner to complete it in three years. Practicing pharmacists who desire to take certain branches of study, may avail themselves of any of the college facilities, but their studies and time will be subject to regulation as special students.

COURSES OF INSTRUCTION.

Pharmacy—*General*—Metrology; nomenclature; pharmaco-technology; dispensing.
Inorganic—Non-metals; Metals; gravimetric analysis; alkalimetry; acidimetry; pharmaceutics.
Organic—Organic drugs; assays; pharmaceutics.
Chemistry—*Inorganic*—General, complete through non-metals and metals; chemical philosophy; pharmaceutical; analytical; qualitative; quantitative (volumetric and gravimetric); toxicological; inorganic poisons.
Organic—General, elementary, descriptive and experimental; pharmaceutical; qualitative; quantitative (volumetric, gravimetric); toxicological, organic poisons.

Materia Medica—*Inorganic*—Non-metals; salts of metals; new remedies.
Organic—Vegetable drugs; new remedies.
Pharmacognosy—*Organic*—Descriptive; microscopical.
Physiology—*Human*—Elementary; descriptive.
Bacteriology—*Elementary*—Descriptive; practical—optional.
Mathematics—*Pharmaceutical—Chemical.*
Urinalysis—*Complete*—Chemical; microscopical.
Latin—*Elementary*—Medical; pharmaceutical.
Hygiene—*Lectures.*
Pharmacal Jurisprudence—*Lectures.*
Mineralogy—*Elementary*—Pharmaceutical.
Physics—*Pharmaceutical—Chemical.*
Toxicology—*Lectures.*
Dispensing—*Practical.*

Homeopathic Pharmacy—*Lectures.*
Micro-Chemistry—*Lectures and laboratory.*

The courses are comprehensive and thorough, especially adapted to the higher education of pharmacists. In the most cases the instruction enters into minute details, and the most effective modern methods of teaching are employed, including laboratory work. The studies are graded and progressive throughout.

FIRST YEAR.

General pharmacy,
Metrology,
Nomenclature,
Pharmaco-technology,
Inorganic pharmaceutical chemistry.
Inorganic elementary chemistry.
Qualitative chemistry.
Pharmacal mathematics,
Physiology,
Botany,
Materia medica,
Pharmaceutics,
Physics,
Pharmacognosy.
Microscopy,
Pharmacopœia,
Latin.

SECOND YEAR.

Advanced pharmacology,
" pharmaco-technology,
" inorg. pharmaceutical chemistry,
"organic pharmaceutical chemistry.
" inorganic general chemistry,
" qualitative chemistry,
" pharmaceutics,
" pharmacognosy,
" microscopy,
" materia medica,
Quantitative chemistry,
Pharmaceutical jurisprudence,
Bacteriology,
Toxicology,
Urinalysis,
Mineralogy,
Hygiene,
Pharmacopœia,
Unofficial pharmacy,
Proximate analysis,
Chemistry of foods.

THIRD YEAR.

Students who divide their work among three years will take the following studies in the first year and divide the remaining subjects equitably among the remaining two years:
Inorganic general chemistry,
Inorg. pharmaceutical chem.
Qualitative chemistry,
Physiology,
Botany,
Latin.

PHARMACY, THEORETICAL AND PRACTICAL.

The junior course begins with preliminary lectures considering the history and development of pharmacy, the rank which pharmacy occupies among other professions, text-books and works of reference. The pharmacopœia and dispensatories receive detailed attention. Measures and weights, the balance—its construction and varieties, and methods of weighing; specific gravity, in detail, follow.

The pharmaceutical laboratory is under the direct charge of the Dean. The time of instruction is so arrangd that the student becomes familiar with the subjects of the lectures from practical work immediately following and relating to them, thereby fixing facts and scientific principles in the student's mind in a manner that does not depend upon his capacity for remembering merely stated facts. A student can better remember that which he did than that which he heard.

Among the practical subjects that receive attention are the following: Drug grinding and powdering, comminution, contusion, trituration, elutriation, levigation, sifting fineness of powders according to the United States Pharmacopœia, etc.

Collection of drugs, drying, curing, cutting, garbling, etc.

Heat—its sources and uses in pharmacy, its determination, latent and sensible heat, thermometers— the various scales, testing and comparing thermometers, combustion of solids, liquids and gases in various kinds of furnaces, stoves and burners; application of heat in drying ovens, steam, hot-air and water ovens; drying closets, desiccators, blowpipes, crucibles; baths for controlling and equalizing heat; water-salt-sand-oil-glycerine-parafine-hot-air-baths, evaporation—spontaneous, rapid, slow, in vucuo; ebullition—boiling points, fusion; sublimation, calcination, granulation, dehydration, torrefaction, roasting, reduction, oxidation, carbonization, deflagration, ingition, etc.

Solutions—chemical, pharmaceutical, simple, complex, saturated; circulatory, displacement.

Dialysis—construction of dialyser; osomsis, endosmosis, exosmosis, crystalloids and colloids,

Maceration—expression, infusion, decoction.

Percolation—history, theories, various methods and forms of percolators, exhaustion repercolation, continuous percolation, etc.

Filtration—filtering medii, filtration of chemical solutions, oils, sryups, rapid filtration, filtration in vacuo, hot filtration, colation.

Decantation —the syphon and its uses; guiding rods.

Distillation—simple, fractional, destructive, kinds and varieties of stills.

Crystallization—water of crystallization, deliquescence, efflorescence.

Granulation—methods ot affecting, etc.

Precipitation—separation, weighing, drying precipitate.

Practical pharmacy—The preparation of pills, solutions, mixtures, cachets, ointments, plasters, suppotitories, powders, emulsions, lozenges, etc. Arrangement and appliances of dispensing department.

Inorganic, U. S. P.

Senior course—This course begins with the consideration in detail of the pharmacy of organic and inoganic drugs. It embraces a careful study of every important galenical preparation with the methods of preparation, physical characteristics, reactions, impurities, adulterations and sophistications, etc.

A study of incompatibility is one of the special features of this course; it is viewed from a pharmaceutical and chemical standpoint.

Among the important subjects that will be treated, are the following:

Plant exudations, gums, resins, balsams, gum-resins, oleo-resins, etc.

Cellulin and its various products

Destructive distillation of wood; acetic series.

Carbohydrates; their relationship and characteristics.

Fermentation products, alcohols, ethers, chloroform, nitrous ether, chloral, spirituous liquors, etc.

Organic acids: The official salts and preparations, of tartaric, salicylic, benzoic, citric acid and others.

Fixed oils and fats: Their preparation, composition and purification; various methods of examination; chemical properties and relations; liquid and solid fats.

Waxes and animal fats.

Volatile oils: Their preparation, physical and chemical properties, composition; adulterations and their detection; botanical and chemical classification.

Alkaloids: Physical and chemical properties; the various methods of extraction and identification; classification, alkaloidal reageants, etc.

Glucosides: Difference from alkaloids; full consideration of properties.

Animal drugs and products; all the animal drugs are taken up in detail.

The prescription; the study of the prescription, of incompatibilities, reactions, solubility, etc. New remedies are studied, and an exposition of their chemistry and pharmacy is presented.

The laboratory work in pharmacy follows each lecture, and has direct reference to the subjects treated at the lecture. The preparation of the official standard of solutions is fully illustrated. The course includes a thorough study of the pharmacy of the following metals and their salts and preparations: Sodium, potassium, ammonium, lithium, barium, calcium, zinc, magnezium, lead, copper, aluminum, mercury, silver, arsenic and antimony, bismuth, iron, manganese, gold, platinum, etc. The course includes a thorough application of the U. S. P. tests for identity, impurities, and strength of official preparations. Considerable time is given to quantitative work, volumetric and gravimetric, including analysis of nostrums, butter, alcoholic liquors and proximate organic analysis if the time permits.

Text-books—U. S. P . U. S. D., Remington's Pharmacy, National Dispensatory, Caspari's Pharmacy.

PHARMACOGNOSY.

This important subject is taught in the senior year.

The vegetable drugs of the United States Pharmacopœia are taken up in the following order: Roots, rhizomes; tubers and bulbs, woods, barks, leaves, herbs and flowers, fruits, seeds, plant exudations, resins, gum-resins, waxes and starches. Each drug is carefully examined, both macroscopically and microscopically. Students are also provided with specimens for home study. The lectures give, in compact form, the history and important features of each drug, with consideration of its importance to the pharmacist. About a month's time is devoted to the examination of powdered drugs, especially those most liable to sophistication. The quizzes include careful drill on the constituents, action and dose and official preparations of each drug considered. Identification receives careful attention, and weekly tests of the student's ability. A short course is given in the microscopic examination of some of the more important alkaloids and glucosides, and of certain emulsions and inorganic salts, if time permits.

Text-book—Sayre's Organic Materia Medica and Pharmacognosy.

Reference books—U. S. P., U. S. D.; Flückiger and Handbury's Pharmacographia, Tschirch's Atlas der Pharmacognosie, etc.

The drugs will be considered in the following order:

Roots—Sarsaparilla (Mexican, Para and Honduras), senega, gentiana, taraxacum, pyrethrum, inula. lappa, apocynum, stillingia, sumbul, asclepias, phytolacca, althæa. belladonna bryonia, calumba. rheum, glycyrrhiza (Spanish and Russian), ipecacuanha, gelsemium, pareira, krameria, rumex.

Rhizomes—Aspidium, zingiber (Jamaica, East Indian and African), calamus, veratrum-iris versicolor, cypripedium, convallaria, sanguinaria, geranium. podophyllum. valeriona, arnica. serpentaria, spigelia, hydrastis, caulophyllum, cimicifuga, leptandra, menispernum. berberis, triticum.

Tubers and Bulbs—Jalapa, aconitum, colchicum, scilla, allium.

Twigs and Woods—Quassia, hæmatoxylon, santalum rubrum and album, guaiacum dulcamara.

Barks—Cinchona (Rubra and Flava), prunus, virgiana, viburnun prunifolium, viburnum opulus, rubus, quercus. granatum, aspidiosperma, frangula, cascara sagrada (false and true), juglans, xanthoxylum, mezereum, gossypii radix, euonymus (of root and stem), quillija, ulmus, sassafras, cascarilla, cinnamomum (Ceylon, Saigon and cassia).

Leaves and Leaflets—Pilocarpus, eucalyptus, uva-ursi, senna (Alexandria and India), erythroxylon (Bolivian and Truxillo), Belladonna, stramonium, hyoscyamus, tapacum, digitalis. matico, salvia hamamelis, castanea, eriodictyon, chimaphila, buchu (long and short), rhustoxicodendron.

Herbs and Flowers—Santonica, caryophyllns, sumbucus, calendula, cusso, arnica, matricaria, anthemis, rosa gallica, rosa centifolia, crocus, zea, chondrus, cetraria, cannabis indica, pulsatilla, scoparius, eupatorium, grindelia, tanacetum, artemisia, absinthium, lobelia, mentha piperita, mentha viridis, melissa, thymus, hedeoma, marrubium, chirata sabina, chelidonium.

Fruits—Juniperus, humulus, piper (longum, nigrum and album), cubeba, pimenta rhus glabra, capsicum, colocynth, cassia fistula, chenopodium, xanthoxylum, illicum, cardamomum, coriandrum, conium, anisum, carum, fœniculum (Roman and German), macis-aurantii amari cortex, aurantii dulcis cortex, limonis cortex, prunum, tamarindus (East and West Indian), phytolacca, ficus, rubus idæus.

Seeds—Physostigma, amygdalus (dulcis and amara), pepo, theobroma, sinapis (alba and nigra); nux vomica, delphinium, staphisagria, ricinus, tiglium, stramonium, colchicum, cardamomum, strophanthus, linum.

Miscellaneous—Guarana lactucarium, aloe (Socotrina. Barbadensis, and Capensis), catechu, gambir, kino (Malabar and Pallas), opium, elastica, manna, saccharum lactis, acacia, tragacantha, mastiche, sandaraca, colophonium, mel, guaiacum, benzoinum, cambogia, galbanum, asafœtida, copaiba, terebinthina, pix (Burgundica et liquida), styrax, balsamum peruvianum, balsamum tolutanum, camphora, thymol, menthol, ammoniacum scammonium, myrrha, ergota (Spanish and German), sassafras, medulla, galla (Aleppo and Chinensis, kamala. lupulinum, lycopodium, amylum, cetaceum, cera, cantharis, coccus, ichthyocolla, moschus.

Besides the foregoing, a number of the more important unofficial drugs will also be discussed.

GENERAL CHEMISTRY.

This is a course in general chemistry given in the department of medicine. In the presentation of the subject, practical work in the chemical laboratory follows the lectures. The system is one which gives the student confidence in his work from the beginning and the better enables him to keep step with the rapid progress of the instruction.

The course is graded through the junior and senior years, with three lectures and two afternoons' laboratory work weekly during the entire first year, and during half of the second year. The second half of the senior year is devoted to lecture work only, the laboratory work concluding in the first half.

Text-books—Remsen's Inorganic Chemistry; Wullings Chemistry.

QUANTITIVE CHEMISTRY.

The course in quantitive analysis is given during the senior year. It is graded and begins with simple gravimetric determination of certain acids and metals, followed by determinations of several ingredients of the same compound, and by complex analysis. Volumetric methods are next learned and applied, then gravimetric and volumetric are employed together. The course is didactic and practical. The work may be increased or decreased at the discretion of the dean of the college.

Text-books—Schimpf's Volumetric Analysis.

ORGANIC CHEMISTRY.

The course is given in the senior year. It includes both descriptive and experimental lecture and laboratory work. The organic chemistry or pharmacy is taught in connection with the course in pharmacy and pharmaceutical chemistry.

PHARMACEUTICAL CHEMISTRY.

Inorganic and organic pharmaceutical chemistry is taught in both the first and second years. As it is so important a part of the curriculum it receives attention both in special lectures and in the laboratory. The principles of chemistry acquired in the other course in chemistry are here applied directly to pharmacy. The chemistry necessary to the thorough comprehension of the Pharmacopœia is expounded and applied in this course.

Text-books—Wulling's Pharmaceutical Chemistry; U. S. P.; Sadtler & Trimble's Pharm. and Med. Chemistry.

TOXICOLOGICAL CHEMISTRY.

The study of this subject follows the course in general chemistry in the senior year. The course includes the chemistry of organic and inorganic poisons. Toxicology proper is included in the course in materia medica.

Text-books—Reese's Toxicology; Taylor on Poisons.

BOTANY AND MICROSCOPY.

The course in botany receives the careful attention which is due to a subject of such importance to the pharmacist. It is a junior study and occupies four hours weekly of the student's time throughout the college year. The course is a thorough one, including microscopy and a large amount of laboratory work.

The course is chiefly devoted to a study of the morphology and anatomy of the higher seed plants with special attention to the microscopic characters of roots, rhizomes, barks, fruits ann seeds. The formation and occurrence of carbohydrates, glucosides, alkaloids, organic acids, resins and gums are carefully studied. Students receive practical training in the preparation and staining of microscopic sections and in the use of micro-chemical reagents. Laboratory work precedes, whenever possible, the lectures on each branch of the subject. Frequent quizzes, both oral and written, serve to fix the salient points in the students' minds.

Text-books—Strasburger, Noll, Schenck, and Schimper, Porter's Translation.

Reference books—Bastin, Bessey, Vines, Bergen.

MATERIA MEDICA AND THERAPEUTICS.

The work in organic and inorganic materia medica, which includes some therapeutics and toxicology, extends throughout the two years, and occupies from two to four hours weekly. It is taught by lectures, frequently illustrated with specimens belonging to the collection of the college. Pharmaco-dynamics, including the study of the identity, quality and characteristics of drugs, which is usually included in materia medica, shares fuller attention in the courses in pharmacognosy.

Text-books—U. S. Pharmacopœia; Bracken's Materia Medica; Maisch's Materia Medica; U. S. Dispensatory and National Dispensatory.

ELEMENTARY PHYSIOLOGY AND ANATOMY.

This subject is taught to the juniors in the latter part of the junior year in a special course of eighteen lectures. The study of the action of drugs and their effects upon the system cannot be intelligently carried on without some knowledge of the structure and functions of the various organs.

Text-book—Martin's Human Body.

BACTERIOLOGY.

The course in bacteriology is given to the seniors, and consists of lectures and recitations illustrated by microscopic preparations and culture of various bacteria. There is also laboratory exercise in the staining and diagnosing of various pathogenic bacteria. Opportunity will be afforded in the laboratory for special research work. This course is optional with students in pharmacy.

Text-books—Schenk's Bacteriology; Sternberg's Bacteriology; Frankel's Bacteriology; Abbott's Bacteriology.

MATHEMATICS.

Students in this college receive careful drill in the subject of pharmaceutical and chemical mathematics during the two years.

URINALYSIS.

This course comprehends both qualitative and quantitative determination of the constituents of normal and pathological urine, and a microscopical examination of deposits. Seniors attend in the latter half of the year. The instruction is given partly in the chemical and partly in the histological laboratory.

Text-book—Tyson's Examination of the Urine; Hoffmann and Ultzmann.

HYGIENE AND SANITARY SCIENCE.

A course of from six to ten lectures is provided in this sublect, if time permits. For seniors.

Text-book—Parks.

HOMEOPATHIC PHARMACY.

A course in homeopathic pharmacy has been added to the curriculum. It comprises both lectures and laboratory work and is given in the senior year.

Text-book—Homeopathic Pharmacopœia.

MICRO-CHEMISTRY.

A brief course is provided for seniors.

MEDICAL AND PHARMACEUTICAL JURISPRUDENCE.

A course of lectures in this subject is provided and seniors are required to attend. The lectures are delivered by the dean of the college.

LATIN.

A special course is provided in medical and pharmaceutical Latin, which all students are earnestly advised to attend. Latin is one of the entrance requirements, and this course has been introduced especially for students who are proficient in the other entrance requirements, but not in Latin. The attendance upon the lectures is obligatory for such, and optional for those who have fulfilled the entrance requirement in Latin. The latter will profit by taking this course as it is especially adapted to pharmacists. One hour weekly is given to the study during the school year.

MINERALOGY.

A short course of lectures embracing the minerals and ores which are the sources of the metals and salts used in pharmacy is provided.

PHYSICS.

Students are required to be familiar with elementary physics, before entering this college. The physics involved in the various chemical and pharmaceutical processes, is, however, fully elucidated as occasion suggests or requires, and considerable attention is given the subject incidentally, principally in the pharmaceutical laboratory.

PHARMACY LAW.

Several lectures will be given to the seniors on the pharmacy laws of the State.

TEXT AND REFERENCE BOOKS.

Pharmacy: U. S. Pharmacopœia, Remington's, Caspari's and Coblentz's, Practice of Pharmacy, U. S. Dispensatory, National Dispensatory, Lyon's Pharmaceutical Assaying, Storer's Dictionary of Solubilities, Hager's Handbook of Pharmacy, Fluckiger and Hanbury's Pharmacographia, Era Formulary, American Pharm. Assoc. Proceedings, Berichte der Pharm. Gesellschaft, Peter's Ancient Pharmacy; National Formulary, Homeopathic Pharmacopœia, German Pharmacopœia, British Pharmacopœia.

Pharmaceutical Chemistry: Wulling, Sadtler and Trimbles, Attfield, Simon, Hoffman and Power's Examination of Medical Chemicals, Schmidt, Elsner.

General chemistry: Remsen's Inorganic, Prescott and Johnson's, Watts' Fownes, Gmelin's Handbook, Roscoe and Schorlemmer, Watts' Dictionary, Fresenius, Sadtler's Industrial Organic Chemistry.

Prescriptions: Ruddiman on Incompatibility. Gerrish's Prescription Writing. Rice's Posological Tables.

Mathematics; Oldberg's Pharm. Problems, Weights and Measures, Mathematical Chemistry, Helm and Morgan's, Metric System by Hamblin Smith.

Materia Medica: U. S. Pharmacopœia, Sayre; Bracken; Maisch, U. S. Dispensatory; National Dispensatory; Culbreth, Bentley and Trimen's Medicinal Plants.

Pharmacognosy: Sayre, Maisch, Rusby and Jeliffe, Fluckiger, Husemann and Hilger's Pflanzenstoffe, Base on Vegetable Microscopy, Hanbury's Pharmacographic and Science Papers. Tschirch and Oesterle's Anatomischer Atlas der Pharmacognosie, Herlant's Micrographie des Poudres Officinales.

Botany: Strassburger, Woll and Shimper's, Bergen, Bastin, Vines, Bessey, Bentley, Gray Cross and Bevan on Cellulose, Wiesner's Rohrstoffe, Strassburger and Hillhouse Geddes, Zimmermann on Botanical Microtechnique, Warning and Posser.

Urinalysis: Tyson, Flint, Von Taksch on Clinical Diagnosis, Simon's Clinical Diagnosis Beale's Chart, Hoffman and Ultzmann, Peyer's Atlas.

Mineralogy: Dana.

Physiology: Martin's Human Body, Foster, Howell's American Text-book of Physiology.

Bacteriology: Schenck, Sternberg, Fraenkel, Abbott.

Toxicology: Reese, Taylor on Poisons.

Latin: Robinson's Latin Grammar of Pharmacy, Jones, Harkness.

Miscellaneous: Gill's Oil Analysis, Mandel's Bio-Chemistry, Leffmann and Beam's Analysis of Milk, Wing's Milk and its Products, Lassar and Cohn's Chemistry in Daily Life, Park's Hygiene aud Sanitary Science. Stewart's Pocket Dose-Book.

LIBRARY.

The students of this college have free access to all the library facilities of the University and of the city. The medical library contains, in addition to about two thousand volumes of a technical nature, the more important American and European medical and pharmaceutical periodicals.

LENGTH OF COURSE.

The complete course extends over two years, of eight and one-half months each. Students may arrange their work so as to take the course in three years, without additional expense to them. It is quite possibe that a three years' course may be required of students in this college in the near future.

The tenth annual course begins Wednesday, September 14, 1901, at 9:00 a. m., at which time all applicants for admission should present themselves with credentials, certificates, etc.

REQUIREMENTS FOR ADMISSION.

I. Candidates who present a diploma of a reputable college, or of a high school of the first grade, or of the advanced course of a Minnesota State normal school, or of the preparatory department of either Hamline University or Carlton College, or of Pillsbury Academy, or of the Minneapolis Academy, or of any institution of similar standing or grade, will be admitted without examination. If the diploma does not cover physics, that branch will need to be taken up by the student during the first year of attendance.

Those bringing certificates of good standing in institutions of the collegiate grade are also admitted without examination.

II. Applicants who bring evidence of having been engaged in the practice of pharmacy for two or more years, who cannot meet the above requirements, are examined in the following branches:

1. English—An original composition of not less than 300 words upon some topic to be announced at the time of examination. Orthography, punctuation, use of capitals, grammatical construction and rhetorical fitness will be considered.
2. Algebra—elementary.
3. Physics—elementary.

III. Other applicants will be examined in the following branches.

1. English.
2. Algebra or geometry—elementary.
3. Physics—elementary.
4. Physiology or botany.
5. Latin—Jones' First Latin Book or an equivalent.

A foreign language, preferably German or French, may be offered in place of Latin, but Latin must then be pursued subsequent to entrance. Applicants whose preparatory course of study has not conformed precisely to the requirements above enumerated will be allowed to offer, in lieu of a portion of these requirements, equivalent preparation in similiar branches of study; and if they show, by examination, or by other evidence, that the work in these branches is substantially equivalent, such branches will be accepted as a substitute for those omitted.

The examinations for entrance are conducted by the faculty of the college of pharmacy, in the pharmacognosy room, beginning at 9:00 a. m., on Tuesday, September 24, 1901. Lecture work begins as soon as possible after the examinations, usually the following day.

PROFESSIONAL EXAMINATIONS.

Examinations are held during the last two or three weeks of the regular session and during the last week in January, and are supplementary to the written recitations and quizzes that are held at frequent intervals during the term, and with them form the basis of final determination of fitness for promotion or graduation. Students are rated throughout the year, and all students who have a standing of eighty-five per cent, or more, in certain of the branches, may not be required to take the final examination in those branches.

Students are not required to write graduating theses, but, instead, they keep complete records of all of their laboratory work. The records are to be kept in substantially bound books, to be approved by the faculty. The respective professors call for the records for inspection and rating once a month or oftener. Duplicates of records are to be furnished the college by the students. The college provides the paper.

CONDITIONS.

Students having conditions in more than one major or in more than two minor subjects of the first year, cannot enter upon the second years' work. All entrance conditions must be removed before the spring examination. Candidates for graduation must have removed all conditions before entering upon the second semester of the graduating year.

ADVANCED STANDING.

Applicants for advanced standing must pass the entrance examinations, or present the usual equivalents. They must furnish satisfactory evidence of time spent and subjects covered in previous professional studies and must present themselves at the above dates and pass the examinations of all departments in which they wish to be exempt, if such examinations are deemed necessary by the professors in charge of the various departments.

DEGREE.

This college confers the degree of pharmaceutical chemist (Ph. C.,) upon the graduates.

REQUIREMENTS FOR GRADUATION.

Regular attendance at lectures, quizzes and laboratory exercises. Students will not be permitted to present themselves for final examination unless they have been in attendance upon at least seven-eights of the required number of exercises.

Every person upon whom the degree is conferred must be of good moral character, and must be twenty-one years old; must have attended two full lecture and laboratory courses, the last at this college, and must have passed a successful examination in the subjects required for graduation.

Drug store experience is not a requirement for graduation.

Those who fail to appear for examination after having paid their diploma fee, or those who do not pass satisfactorily, will be permitted to present themselves at any subsequent examination, upon paying an additional fee of five dollars, and complying with all other requirements.

GRADUATE COURSES.

In addition to the course outlined, and which leads to the degree pharmaceutical chemist (Ph. C.), this college offers two graduate courses, the first to continue through one college year and to lead to the degree master of pharmacy, and the second to continue through an additional year or longer, and to lead to the degree of doctor of pharmacy. The first graduate course, the one leading to the master's degree, is now in operation. It is intended that the curriculum shall include higher pharmaceutical chemistry, pharmaceutical assaying, higher organic chemistry, proximate and ultimate analysis, chemistry of foods, spectroscopic work, therapeutics, and bacteriology, and a thesis of at least 3,000 words, embodying the results of original work.

The requirements for admission are a diploma from a Minnesota high school of the first grade, or an equivalent; a diploma from a college of pharmacy whose curriculum, extent and kind of work and length of undergraduate course are equal to those of the undergraduate work of this college; an acquaintance with either German or French sufficient to enable the student to read and understand the scientific literature in these languages, and a certificate of registration as pharmacist from any state board of pharmacy. The fees for this course will be seventy-five dollars, and, in case of graduation, an additional fee of ten dollars for diploma. The rules relating to damage, waste and breakage in laboratories are the same as those obtaining in the undergraduate course.

The course leading to the doctor's degree will begin as soon as there are sufficient applicants.

BREAKAGE AND LOSS.

In each laboratory course the student will be assigned a certain amount of apparatus and material, for which he will give a receipt. At the end of each course, if such apparatus and material are restored in good condition this receipt will be returned to him.

All apparatus lost or damaged will be charged to him and must be paid for before he can receive credits for his course or take his annual examinations.

GENERAL STATEMENT.

Those who do not pass the entrance examinations, may enter this college and complete their course in three years, provided they pursue the subjects required for admission, in addition to the professional work that may be assigned to them, and pass their entrance examinations, before the end of the first year. There are a number of preparatory schools in the neighborhood of the University, where the subjects required for admission may be pursued.

Students will be permitted to use their own crude drugs for the making of preparations, provided such material is approved by the dean of the college as suitable to demonstrate the lesson in hand. Finished products from such material, if of satisfactory quality, are at the disposal of the student, unless made with the tax-free alcohol belonging to the college.

Absence will not be excused, unless satisfactory reasons are given to the professor in charge. Habitual absence without a satisfactory excuse, continued indifference to study, or persistently poor scholarship may subject the student to temporary or permanent suspension. Students are earnestly requested to be present at the beginning of the school year. Special students, however, may enter at any time; they will not be rated in their work, nor will they be examined unless they make special request therefor. All the facilities for work in the University are open to the students of this college, subject to the approval of the dean. Opportunity is afforded to do advanced work in all branches. Text-books may be obtained after coming to the University.

FEES.

TWO YEAR COURSE.

First year	$75.00	
Second year	80.00	
Diploma	10.00	
		$165.00

Students who divide their work into three years pay their fees as follows:

THREE YEAR COURSE.

First year	$45.00	
Second year	55 00	
Third year	55.00	
Diploma	10.00	
		$165 00

There are no other fees in the regular course. Half the annual fees are payable before entrance, the remaining half *before* February 1st. Those desiring to take special work will be required to pay fifteen dollars a subject in the didactic courses and twenty-five dollars in the laboratory courses.

Students will be charged for laboratory material if used unreasonably. At the end of laboratory courses students will be required to pay for breakage and damage to utensils in their care. If a student is careful this charge need not amount to more than two or three dollars. Students are to provide themselves with a set of metric weights, a set of apothecary's weights and steel spatulas. The expense of these is within two dollars. Students using platinum crucibles are charged for same. Upon the return of the crucible in the original condition the charge is cancelled. If the crucible is in any wise damaged, the full value is collected from the student. A rental of two dollars per college year is charged for the use of a microscope. All money is payable to the Accountant of the University who will give receipts which must be deposited with the Dean. The receipts are returned to students at the end of each year.

Students will be required when entering upon laboratory work, to deposit five dollars with the accountant to cover breakage, damage and waste. At the end of the laboratory course any part of the sum unused will be returned to the student.

The diploma fee is to be paid by candidates for graduation before the beginning of the final examinations. Those whose term rating exempt them from the final examinations pay the diploma fee at least one week before commencement.

If a student is forced to discontinue work before the Christmas vacation, for sufficient reasons, his lecture fee will be returned pro rata; if he discontinues work for insufficient reason, the fee will be retained and credited pro rata, on any succeeding course of lectures.

Laboratory fees will not be returned, except in case of discontinuance for sufficient reason, before the student has been assigned to a place in the laboratory. It is necessary that the students enter at the opening of the session in order to be admitted to the laboratories.

STATE BOARD OF PHARMACY.

The Board meets at the college in January, April, July and October of each year. For information concerning the Board, address the Secretary, Mr. H. G. Webster, 417 Bank of Commerce Building, Minneapolis, Minn.

COLLEGE OF PHARMACY ALUMNI ASSOCIATION.

The Alumni Association meets annually in the college building the day before commencement, at 3 p. m. Every member of the Association is urgently requested to report change of address to the secretary.

COMMUNICATIONS.

Address all communications to the Dean, Frederick J. Wulling, University of Minnesota, Minneapolis, Minn.

Students.

GRADUATE STUDENTS, 160.

CANDIDATES FOR THE DEGREE OF DOCTOR OF PHILOSOPHY—38.

Alcott, A. N. *B. A., Washington and Jefferson Univ.* Sociology, Philosophy, History.	Minneapolis.
Angus, William, *B. A., '93.* American Public Economy—Taxation, History.	Wadena.
Benton, George H., *B. A., Yale.* Economics, History, Politics.	Minneapolis.
Bergin, Rev. Alfred, *M. A., Augustana.* Semitic, German, Scandinavian.	Cambridge.
Borass, Julius J., *M. L., '95.* Psychology, English, Pedagogy.	Red Wing.
Brohough, Gustav O., *B. L., '89.* Political Economy.	Red Wing.
Butters, Frederick K., *B. S., '99.* Botany, Zoology, Geology.	Minneapolis.
Campbell, John E., *M. S.* Chemistry, Embryology, Mineralogy.	Minneapolis.
Copeland, John, *M. A., Princeton.* Sociology, History of Philosophy, Economics.	St. Paul.
Cotton, George W., *M. A., Upper Iowa University.* History, English.	Frederisksburg, Ia.
Curtis, John P., *M. S.* Psychology, Chemistry, Geology.	Minneapolis.
Davis, Daniel D., *B. A., Marietta.* Philosophy, Economics, Sociology.	Minneapolis.
Dever, Charles S., *B. L., LL. B.* International Law, Private International Law, Political Economy.	Minneapolis.
Driscoll, Alfred E., *M. A., Manitoba.* Philosophy, English, Greek.	St. Paul.
Eliason, Adolph O., *B. L.* Political Science, Law, History.	Montevideo.
Freeman, Edward M., *M. S.* Botany, Embryology, Chemistry.	St. Paul.
Gains, Alvin D., *M. A., Dartmouth.* Economics, Philosophy, English.	St. Anthony Park.
Geisness, Thomas, *M. A., '99.* Comparative Philology, English Philology, Latin.	Minnehaha Falls.
—Gibbs, Gertrude E., *B. S., M. S., Cornell.* Botany, German, Zoology.	Faribault.

Glasoe, Paul M., *M, S.* Chemistry, Physics, Mineralogy.	Minneapolis.
Holmstedt, Victor E., *B. A.*, *Gust. Adolph.* Mathematics, History, Scandinavian.	Minneapolis.
Johnston, George H., *M. S.*, *'97.* History, Philosophy, Political Economy.	Minneapolis.
McDonald, Hope, *M. S.* History, Political Science, Philosophy.	Minneapolis.
McKay,Donald D., *B. A.*, *Manitoba.* Philosophy, Psychology, Ethics.	Minneapolis.
Nicholson, Edward E., *B. S.*, *Nebraska.* Chemistry, Mining, Metallurgy.	Minneapolis.
Pease, Levi B., *M.* S. Chemistry, German, Mining.	Minneapolis.
—Peck, Mary G., *B. A.*. *Elmira.* English, History, Comparative Philology.	Minneapolis.
—Potter, Frances B., *M. A.*, *Elmira.* English, French, Italian.	Minneapolis.
Rachie, Elias, *M. L.* Political Science, English, Comparative Philology.	Minneapolis.
Ringstad, Edward O., *B. L.* English. Comparative Philology, Old Swedish.	Hector.
Rypins, Isaac L., *B. L.*, *U. of Cinn.* Philosophy, Greek, Semitic.	St. Paul.
Schmidt, Gottfrid, *B. S.* Mathematics, Animal Biology.	St. Paul.
—Shillock, Anna, *M. L.*, *'97.* German, History, Philosophy.	Minneapolis.
Swenson, David F., *B. S.* Philosophy, Greek Physiology.	Minneapolis.
—Tilden, Josephine, *M. S.*, *'97.* Algology, Organic Chemistry.	Minneapolis.
Tuckey, Edson N., *B. A.*, *Hamline.* History, Philosophy, Political Science.	Minneapolis.
Wilkin, George F., *B. A.*, *Rochester.* Sociology, Philosophy, History.	Minneapolis.
Zeleny, Anthony, *B. S.*, *'92; M. S.*, *'93.* Physics, Theoretical Mechanics, Mathematics.	Minneapolis.

CANDIDATES FOR THE DEGREE OF MASTER OF ARTS—19.

Austin, Lloyd B., *B. A.* History, Political Science, Latin.	St. Paul.
Beach, Joseph W., *B. A.* Major—English, French, Philosophy.	Minneapolis.
Bessesen, Henry J., *B. A.* Political Science, History, Logic.	Albert Lea.
Benham, Allen R., *B. A.* Major—English; German, Greek.	St. Paul.
—Biglow, Helen, *B. A.*, *Grinnell.* Latin, German, History.	Minneapolis.
Eaton, Benjamin Galen, *B. A.*, *Bates.* History, Greek, Philosophy. Latin.	St. Paul.
Gower, Ethel M., *B. A.*, *Smith.* Major—English; Philosophy, Greek.	New Haven, Conn.
Guise, John M., *B. A.*, *Macalester.* Major—Psychology.	St. Paul.

Heglund, Martin J., *B. A.*, *Luther.* Major—History; Political Science.	Minneapolis.
Larson, Adolph, *B. A.*, *St. Olaf.* Political Economy. English, Latin.	Osceola, Wis.
Lysnes, Olaf, *B. A.*, *St. Olaf.* Hebrew, Political Science, French.	Canton, S. D.
Pemberton, John, *B. A.*, *Hamline.* Philosophy, Economics, Greek.	St. Anthony Park.
Rankin, Albert William, *B. A.*, *'80.* History, English, German.	Minneapolis.
Sanford, Edward P., *B. A.*, Major—Economics.	Minneapolis.
Snyder, Fred B., *B. A.* History, Politics, English Literature.	Minneapolis.
Stangeland, Charles E., *B. A.*, *Augsburg.* Major—Economics; History.	Minneapolis.
Svien, Sever J., *B. A.*, *St. Olaf.* Hebrew, Greek, English.	Dennison.
Teisberg, Carl O., *B. A.*, *Luther.* Major—History.	Clarkson, Wis.
Wollan, Gustav C., *B. A.*, *Luther.* Major—Greek.	Starbuck.

CANDIDATES FOR THE DEGREE OF MASTER OF SCIENCE—31.

—Boot, Estelle Bennet, *B. L.*, *So. Dak.* Philosophy, History, Sociology.	Minneapolis.
Bedford, Fred W., *B. S.* Major—Chemistry.	Minneapolis.
Berg, John Nelson, *B. S.* Political Economy, History, Philosophy.	St. Paul.
Cohen, Lillian, *B. S.* Major—Chemistry; Zoology, Physics.	Minneapolis.
Duncan, Theodore L., *B. S.* Geology, Forestry, Surveying.	St. Anthony Park.
Erickson, Henry Anton, *B. E. E.*, *'96.* Physics, Mathematics, Astronomy.	Minneapolis.
Emmons, Frank W., *B. S.* Chemistry, German, Mineralogy.	Minneapolis.
—Fanning, Mary G., *B. S.* Botany, History, Geology.	St. Paul.
—Forsyth, Olga B., *B. S.*, Major—History, Philosophy, English.	Minneapolis.
Galloway, Lee, *B. S.* History, Economics, German.	St. Paul Park.
Guthrie, Joseph E., *B. S.* Major—Animal Taxonomy.	Minneapolis.
Hemingway, Ernest E., *B. A.*, Major—Animal Biology.	Fox Lake, Wis.
Hilden, Hans Edward, *B. A.*, *St. Olaf.* Mathematics, Physics, Chemistry.	Watson.
Hoverstad, Torger, *B. Ag.*, *B. S.* Political Science.	Crookston.
Kunze, William Frederick, *B. S.* Chemistry, Geology.	Hastings.
—Leavitt, Clara K., *B. S.* Botany, Geology, French.	Minneapolis.
LeMiller, Mark A. J., *B. S. U. of Ind.* German, Astronomy, English.	Minneapolis.

Lyon, Harold, *B. S.* Major—Botany; Animal Biology, Geology.	Minneapolis.
Magnusson, J. P., *Gust. Adolph.* Chemistry, Geology, Physics.	Hastings.
Marshall, John W., *B. S.* Economics, Astronomy, Psychology.	Wadena.
Miner, J. Burt, *B. S.. L. L. B.* Major—Psychology; Animal Biology.	Berlin, Wis.
Murfin Arthur M., *B. S.* History, Philosopoy, Political Science.	Sleepy Eye.
Nelson, Emil A., *B· S., Augustana.* Major—Political Science.	Minneapolis.
—Parker, Isabel D., *B. S.* Major—Chemistry; Philosophy.	St. Anthony Park.
Pickett, Victor G., *B. S. '96.* Economics, History, English.	Minneapolis.
Sorkness, Halvor O., *B. Ag.* Geology, Chemistry, Forestry.	St. Anthony Park.
Stewart, William B., *B. S.* Major—Botany.	Bemidji.
Westerson, William A., *B. S., Carleton.* History, Political Science, Geology.	White Rock.
Wheeler, William A.. *B. Agr.* Major—Botany; Bacteriology, Geology.	Minneapolis.
—Wilder, Helen A., *B. S.* Mathematics, German, English.	Minneapolis.
Zeleny, Charles, *B. S.* Zoology, Botany, Chemistry.	Minneapolis.

CANDIDATES FOR THE DEGREE OF MASTER OF LITERATURE—18.

Anderson. Jens, *B Ph., Northwestern.* Comparative Philology, German, Scandinavian.	Northwood, Ia.
—Brill, Ethel C., *B. L.* History, Philosophy, English.	St. Paul.
Buer, James, *B. L.* English, Economics.	Faribault.
Burtness, Peter, *B. A., Luther.* Major—English.	Willmington.
—Day, Mary B , *B. L., Carleton.* English, History, Rhetoric.	Minneapolis.
Force, Frank E., *B. L.* Major—French.	Minneapolis.
Hartmann, Marcus, *B. A., St. Olaf.* Major—History; German.	Minneapolis.
—King, Josephine Marrs, *B. L.* History, German, English.	Minneapolis.
Klose, W. H., *B. A., Roanoke.* German, French, Comparative Philology.	Minneapolis.
Lohre, Nels J., *B. L. So. Dakota.* Major—German.	Minneapolis.
Peterson, J. M., *B. A., Luther.* Major—German.	Minneapolis.
—Rankin, Mrs. Jean S., *B. S., Ripon.* English, Pedagogy, Philosophy.	Minneapolis.
—Rossman, Floy A., *B. Ph., Hamline.* Major—English, Political Economy and History.	Hamline.
—Rounds, Ona M.. *B. Ph., Upper Iowa.* Major—English, History and Philosophy.	Fayette, Ia.

—Shellenberger, Emma W., *B. Ph., Iowa.* Major—English, History.	St. Anthony Park.
—Shortt, Edith M., *B. L.* History.	St. Paul.
—Traver, Madeleine M., *B. A., Vassar.* Major—Philosophy.	Minneapolis.
Wyer, Malcolm G., *B. A.* Major—French; German, English.	Minneapolis.

OTHERS DOING GRADUATE WORK—54.

—Abbott, Emma A., *B. Ph., Cornell (Ia.)* English.	Minneapolis.
Alexander, Hugh. *B. A. Macalester.* Astronomy.	St. Paul.
Allen, Walter J., *B. S.* German, Drawing.	Minneapolis.
—Anderson, Martha Scott, *B. A., Wesleyan. (O).* History, English.	Minneapolis.
—Beach, Elizabeth S., *M. S.* History.	Faribault.
—Bell, Mrs. J. W., English.	Minneapolis.
Briggs, Charles H., *B, S., Cornell.* Chemistry.	Minneapolis.
—Bretness, Marion LeRoy. Greek.	Minneapolis.
—Cheney, Lora Allen, *B. A., Simpson.* English Literature.	Minneapolis.
—Clark, Keith, *B. Ph., Hamline.* English, Literature.	St. Paul.
—Colquhoun, Flora, *Holland.* Old French, English.	Minneapolis.
Crownover, C. E., *C. E.* Civil Engineering.	Minneapolis.
—Custer, Junie L., *B. L.* English.	Minneapolis.
Dyer, George E., *B. A.* Economics.	Houston.
Elwell, History.	
—Evans, Tamazine McK., *M. L.* English.	Minneapolis.
—Firkins, Ina, *B. L.* English.	Minneapolis,
—Fish, Florence, *B. A.* Greek, Philosophy.	Minneapolis.
Ford, Robert E., *B. E. E.* Mathematics, Psychology. Politics, Foundry Shop.	Pasadena, Cal.
Harris, James D.	St. Paul.
Heglund, Martin J., *B. A.* Economics.	Minneapolis.
—Hillman, Ada B., *B. L.* English.	Minneapolis.
—Hinton, Mrs. C. F. English.	Minneapolis.
—Hodder, Mrs. Mabel E. B., *B. A., Syracuse.* History, English, Latin.	Minneapolis.

Innis, Homer C., *B. A., Hamline.* Chemistry, Assaying.	Hamline.
Jackson, Robert M., *B. S.* Comparative Philology.	Winona.
—Jackson, Jeanie M., *B. A.* German, Spanish.	Minneapolis.
—James, Mrs. James, English.	Minneapolis.
Kampen, Ingvold Anderson, *B. A.* English Philology and Scandinavian.	Minneapolis.
Kingery. Newton, *B. A. Wabash.* Astronomy.	St. Paul.
—Koch, Gesena W., *B. S.*, Sociology.	Minneapolis.
—Lagerstrom, Lydia T.. *B. S.* English Literature.	Minneapolis.
Langemo, Peter C., *B. L., Wisconsin.* Economics, Politics.	Kenyon.
—Lindley, Mrs. Anna G., *B. L., Smith.* English.	Minneapolis.
—Lommen, Ingeborg G., *M. L.* German.	Minneapolis.
—McDermid, Kate. Chemistry.	Minneapolis.
—Mahood, Emily G., *B. A., Toronto.* Philosophy, English.	St. Anthony Park.
—Mareck, Fecilitas, *B. S.* Comparative and English Philology and Norse.	Minneapolis.
Mattson, Rev. P. A., *B. A. Augustain.* Hebrew, German.	Minneapolis.
Merrill, S. B., *Lehigh.* Chemistry.	Minneapolis.
Olander, C. M. C. History.	
—Olds, Mrs. Harriet T., *B. L., Carleton.* English.	Minneapolis.
Ormond, James E., *B. S.* Economics.	Hegbert.
—Pendergast, Sophie. *B. L.* German.	Hutchinson.
—Phelps, Ruth S., *B. L., Smith.* English.	Minneapolis,
Plondke, F. J., *M. D.* Economics.	Minneapolis.
—Powell, Florence, *B. A.* History.	Minneapolis.
—Ray, Alice P. English.	Minneapolis.
—Sterrett, Lillian Josepha, *B. S.* German.	Minneapolis.
—Strommeier, Clara V.	Minneapolis.
Thompson, Paul J., *B. A., Ripon.* Political Science, Latin, History.	Minneapolis.
Tucker, Frederick D., *M. A.* Political Science.	St. Anthony Park.
—Webster, Jennie German.	Minneapolis.
—Whitney, Nellie A., *B. L.* English.	Minneapolis.

COLLEGE OF SCIENCE, LITERATURE AND THE ARTS.

SENIOR CLASS,—133.

CLASSICAL SECTION, 26.

Ahnfeldt, Alfred Nelson, Chicago, Ill.
Bernhagen, John Fred, Minneapolis.
—Brandsmark,Gertrude Marie, Minneapolis.
Burkhard, Oscar Carl, Preston.
Carson, Frank, Upsala, Minn.
Chase, Josiah Hook, Minneapolis.
—Colter, Florence Pearl, Minneapolis.
—Davis, Addie May, Minneapolis
Davis, Louis David, Elgin.
Gullette, Albert Martin, Osseo.
—Hutchinson, Drusilla Christiana, Minneapolis.
Jewett, Frank Fanning, Minneapolis.
—Koenig, Helen Ida, Minneapolis.
Libby, Harry Clinton, Minneapolis.
Liberma, Marco F., Minneapolis.
McGregor, Ernest Frank. Minneapolis.
—Maley, Linda Helen, Minneapolis.
Olander, Carl Martin Constantine, Minneapolis.
Otte, George Benjamin, Farmington.
Squires, Ralph Elmo, St. Paul.
—Sunne, Dagny, Minneapolis.
Tate, Isaac Nesbit, Fairbault.
Thoreson, Ole, Woodville, Ia.
Travis, William H.
Vikner, Edwin J. W., Minneapolis.
—Wakefield, Bertha, Sioux City.

SCIENTIFIC SECTION, 58.

—Adams, Cara May, Lisbon, N. D.
Adams, Sidney DeWitt, Lisbon, N. D.
Alexander, William August, Carver.
Bell, James Ford, Minneapolis.
Biedermann, Jacob, Stillwater.
Burger, J. Archie, Huron, S. D.
—Burnes, Isabell Frances, Minnetonka Mills.
—Burns, Sara, St. Paul.
Buttz, Adrian, Buttzville, N. D.
Carlson, Elmer Ethan. Lake City.
—Case, Cleona Louisa, Minneapolis.
—Case, Mable Amelia, St. Peter.
—Child, Alice May, Glencoe.
Chrysler, Karl Gerard, Lake Park, Ia.
Cook, Louis Gray, Minneapolis.
Crouley, William Dudley, Redwood Falls.
Denton, Van Lyman, Minneapolis.
Erickson, Theodore O. Flandreau, S. D.
—Fanning, Clara Elizabeth, Minneapolis.
Forbes, Mason Merrill, Duluth.
Frost, William Stewart, Willmar.
Golseth. Gustav, Ashby.
Grass, Charles F., Feagus Falls.
Hanson, Peter, Sleepy Eye.
Hodgson, William Clague, Herman.
Houlton, Sam R., Elk River.
Ireland, Roy R., Minneapolis.
—Jenness, Josephine Fancher, Wilmar.
—Kamrar, Melva L., Blue Earth City.
—Kelly, Margaret Reat, Aberdeen, S. D.
—Kelsey, Grace Louise, St. Paul.
Kiefer, Michael Anseln, Sleepy Eye.
Knight, Harold Morris, Glencoe.
—Lamoreaux, Ellen Adelia, Newark, N. Y.
Lende, Olai A., Hanley Falls.
—Mahoney, Laura Charlotte, Luverne.
Moenette Jeanette, Chatfield.
Nelson, Otto Ferdinand, Hastings.
—Olds, Alice Alena, Luverne.
Parmelee, Egbert Nelson, Mankato.
—Patch, Edith Marion, Camden Place.
Peterson, Alfred Emanuel, Litchfield.
Peterson, Selmer L., New Sweden.
—Prendergast, Alice M., St. Paul.
—Reid, Nettie Clara, Minneapolis.
Reid, Niles Edgerton, St. Paul.
—Robbins, Amy, Robbinsdale.
Rodgers, Walter Spottswood, Farmington.
Rosendahl, Otto, Spring Grove.
—Smith, Edna Lamb, Minneapolis.
Smith, John Philip, Cottonwood.
Smith, Paul S., Minneapolis.
Solhaug, Jens Johan, Starbuck.
—Thompson, Rosamond Estella, Minneapolis.
Ware, J. Roland, Pipestone.
Wetzel, Reinhard A., Sank Rapids.
—Whalen, Anna, Minneapolis.
Wheeler, Frederick Lacy, Minneapolis.

LITERARY SECTION, 38.

—Baker, Gertrude Whittier, St. Paul.
—Bartleson, Maud Muller, Minneapolis.
—Barton, Bertha M., Minneapolis.
—Brunes, Gunda, Minneapolis.
—Carpenter, Emma H., Minneapolis.
—Christison, Isabelle, St. Paul.
—Comstock, Jesse May, Moorhead.
—Cornish, Bonnie, Myrna.
—Cutler, Helen Gertrude, Red Wing.
Ferry, Thomas Patrick, De Graff.
—Foerster, Alma Ida, St. Paul.
—Freeman, Maude Gertrude, St. Paul.
—Glasoe, Olga, Spring Grove.
—Glover, Daza Marguerite, Minneapolis.
—Helliwell, Helen. Minneapolis.
—Hemenway, Helen Juliet, Minneapolis.
Hubbard, Walter Raymond, Huron, S. D.
—Keller, Annice Boory, Minneapolis.
—Kjosness, Hannah Josephine, Madison.
—Kjosness, Martha Albertine, Madison.
—Langley, Mary C., Minneapolis.
Lawrence, James Wetherby. Jr., Minneapolis.
—Lenox, May, Minneapolis.
Luse, Claude Zeph. St, Paul.
McGinnis, James B., Benson.
—Mann, Edith, St. Paul.
Massee, Will W., Menominee, Wis.
—Matson, Sadie Lee, St. Paul.
Melom, Carl Marcus, Dawson.
—Moore, Margaret, Minneapolis.
—Morey, Vera Louise, Minneapolis.
—Morley, Clara Edith, Minneapolis.
Northrop, George Norton, Platteville, Wis.
Olsgard, Edwood Cornelius. Lacota, N. D.
Olsgard, Helmer Osaias, Lacota, N. D.
—Phillips, Kate Edna, Minneapolis,
—Randall, Bertha Augusta. Anoka.
Schacht, Theodore Albert, Elgin.
—Snell, Edith Jane, St. Paul.
—Spicer, Jessie Irene, Willmar.
—Stanford, Blanche Mary, Kelso, N. D.
Stevens, Hal J., Minneapolis.
—Steward, Clara Evarts, Minneapolis.
Thomas, George Edwin, St. Paul.
—Tobin, Frances Marion, Minneapolis.
—Todd, Edith Cornelia, Minneapolis.
—Velikanje, Johanna Emma Clara, Minneapolis.
—Woodcock, Gertrude, Minneapolis.

CIVIC SECTION, 11.

Aaberg, Arne O., Starbuck.
—Alcott, Mary Elizabeth, Minneapolis.
Cloyd, David E., Minneapolis.
—Gates, Gertrude Eliza, Minneapolis.
—Johnston, Fannie, Mankato.
—Lundgren, Alma Marie, Alexandria.
McGregor, Eliza, St. Paul.
Parshall, Dana Herman, Faribault.
Ribble, George B.. St. Peter.
Schall, Thomas D., St. Paul.
—Torrelle, Ellen, Minneapolis.

JUNIOR CLASS, 200.

CLASSICAL SECTION, 24.

Ackerson, Willard Henry, Minneapolis.
Butterbrodt, Frank Christian, Minneapolis.
—Currer, Helen Henrietta, Le Sueur.
—Elliott, Grace Nelson, St. Paul.
—Fish, Helen Randle, Minneapolis.
Fogarty, Patrick Henry, Buffalo.
—Graham, Alice Pitcairn, Minneapolis.
Heard, Paul Carrier, Minneapolis.
Howes, Lyman Joseph, Duluth.
Kellogg, Lee Olds, St. Paul.
—McGregor, E. Elise, Minneapolis.
—McGregor, Jennie Beatrice, Minneapolis.
—Morrison, Theresa Eleanor, Ryegate, Vt.,
—Murphy, Myrtie Agnes, St. Paul.
Pinger, Wilhelm Robert Richard, Minneapolis.
—Polk, Grace Elizabeth, Minneapolis.
Reed, John Homer, Minneapolis.
—Saltnass, Olga Emelie, Minneapolis.
—Siegmann, Alvina, Minneapolis.
Silloway, George Elbridge, Minneapolis.
—Stanley, Mayme E., Minneapolis.
Stein, George W., St. Paul.
Valerius, Nels Erik, Waconia.
Wright, Ernest W., St. Paul.

SCIENTIFIC SECTION, 63.

—Aarnes, Alvida, Montevideo.
Bailey, Campbell L., Minneapolis.
Bessessen, William Aaron, Albert Lee.
Blasing, May Louise, Henderson.
Brand. Charles John, Big Stone City, S. D.
Brattland, Gilbert Anderson, Ada.
Brown, Paul F., Minneapolis.
Burrill, Paul C., Hawley.
Bush, William Emmet, Denmark, Minn.
Cadwell, Chauncey, Le Sueur.
—Cole, Ruth Fitch, Minneapolis.
Collins, Arthur N., Minneapolis.
—Cox, Maybelle, Woonsocket, S. D.
Dalaker, Hans H., Ossian, Ia.
—Diesem. Louise Kellogg, LaMoure, N. D.
—Dohm, Laura Anna, St. Paul.
Durand, Jay Isaac, Crookston.
Egleston, M. Jay, Wykoff.
—Finke, Pauline Henrietta, Minneapolis.
—Foulke Edith, St. Paul.
Francis, Harry Marshall. Hillsboro, N. D.
Gilfillan, Edward Smith, Washington, D. C.
—Goodwin, Helen Marie. St. Paul.
Griffith, Charles Augustus, Minneapolis.
Harris, Bruce Franklin, Crookston.
—Hillesheim, Catherine, Sleepy Eye.
—Hillesheim, Clara, Sleepy Eye.
—Hodgmire, Floy Edna, Minneapolis.
—Hone, Daisy Sarah, Minneapolis.
Horton, Homer Francis, Algona, Ia.
Hosmer, Frank Henry. Farmington.
Hutchinson, John Corrin, Jr., Minneapolis.
—Johnson, Antoinette Wallace, Minneapolis.
—Johnson, Hannah, Willmar.
—Jones, Elizabeth Marie, Minneapolis.
Kienholz, William Simon, Bellingham.
—Kiichli, Adelaide, Duluth.
—King, Lillian Virginia, St. Paul.
—Kinsey, Esther Eliza, Minneapolis.
Lange, Deitrich, St. Paul.
—Lilley, Gene, Aberdeen, S. D.
—McHerron, Minnie Katherine, Minneapolis.
—McNulty, Agnes Sarah, Forest City.
Mayo, Carl Asa, Minneapolis.
Moody, Halsted Carpenter, St. Paul.
Morton, Willis Richmond, Pipestone.
Moyer, Waldo Emerson, Montevideo.
Murfin, Walter Henry, Sleepy Eye.
O'Brien, Charles Smith, St. Paul.
—O'Brien, Frances Marie Pansy, St. Paul.
Parkin, Ernest J., Pine Island.
Passer, Adolph August, Le Sueur.
Powell, Chalmer Lucas, Minneapolis.
—Pullen, Lydia Carlton, Harrison.
—Rodlun, Maybel Cordelia, Willmar.
Russell, Bert, St. Paul.
Saunders, Percy Seavy, Minneapolis.
Schrader. Herman Friedrich, St. Paul.
Staples, Elbridge Cole, Minneapolis.
Steenson, Jesse Grant, Eden Prairie.
—Thomas, Edith Mighill, Minneapolis.
—Tuohy, Edward Leo, Chatfield.
Weed, Benjamin Bartlett, Minneapolis.

LITERARY SECTION, 62.

—Abbott, Mabel Louise, Minneapolis.
—Blackwell, Adah, Minneapolis.
—Blitz, Annice Dudley, Minneapolis.
—Buell, May Emma, Minneapolis.
—Burgess, Achsa, Minneapolis.
—Butler, M. Belle, St. Paul.
—Byrnes, Jane Catherine, Minneapolis.
—Cannon, Bernice May, St. Paul.
—Cornish, Vesta, Vernon Center.
—Davis, Grace, Minneapolis.
—Davis, Jessie Emeline, Anoka.
—Dougan, Alice, Denver, Col.
Erickson, August George, Springfield.
—Farnham, Gratia, Minneapolis.
—Field, Pauline, Minneapolis.
—Fosseen, Mabelle Helen, Minneapolis.
—Gilman, Glenora L., Minneapolis.
—Golden, Laura Elizabeth, Minneapolis.
—Goodrich, Florence Eva., Minneapolis.
—Harrington, Helen, Minneapolis.
—Harrington, Mary Miranda, Minneapolis.
—Hartzell, Margaret Sproat, Minnehaha.
—Hermann, Della, Minneapolis.
—Hermann, Edith Lillian, Minneapolis,
Heuston, Frank Zell, Winona.
—Hitchings, Jennie Alice, Sutherland, Ia.
—Hocanzon, Hemelia Lydia, St. Paul.
—Huntley, Marguerite, Minneapolis.
—Jackson, Alice, Minneapolis.
Johnson, Peter R., New Ulm.
Kelley, Robert Lincoln, Minneapolis.
Kindseth, Martin Severin, Hader.
—Knoblauch, Ida, Minneapolis.
Lambert, Bernard Nelson, Waverly.
—Lewis Sarah, St. Paul.
—Macdonald, Gladys Ermyntrude, Minneapolis.
—McDougal, Marjorie, Minneapolis.
—McMillan, Margaret, Minneapolis.

—Marshall, Gertrude Isabel, Minneapolis.
—Matchan, Edna May, Minneapolis.
Montgomery, George D., St. Paul.
—Moore, Charlotte Love, St. Paul.
—Nixon, Lillian E., Pembina, N. D.
—Ozias, Helen L., Minneapolis.
—Peck, Edith Laura, Minneapolis.
—Pennington, Georgiana, Minneapolis.
—Petran, Ethel May, Minneapolis.
Pryor, Leonard H., Minneapolis.
—Richards, Luverne, Cresco, Ia.
—Sadley, Elizabeth, Viola, Princeton.
—Sanford, Mary Frances, Minneapolis.
—Smith, Florence Ella, Minneapolis.
—Starr, Augusta Mara, Minneapolis.
—Stinchfield, Nellie May, Rochester.
—Swart, Emma Laurel, Fargo, N. D.
—Swett, Georgia Mitchell, Minneapolis.
—Towler, Lucy, Minneapolis.
—Trimmer, Harriet Belle, Minneapolis.
—VanEvera, Florence, Minneapolis.
Wetmore, Robert Wallace, Minneapolis.
—Williams, Juanita, Duluth.
—Woodward, Mary Lydia, Langdon.

CIVIC SECTION, 51.

Alexander, Charles Lewis, Kasson.
Anderson, Peter John, Helena, N. D.
—Andrews, Elizabeth Kidder, Faribault.
—Barstow, Elizabeth Douglas, St. Peter.
—Brady, Eva Willoughby, Dodge Center.
—Camp, Helen Elizabeth, Minneapolis.
Campbell, Henry Don, St. Paul.
Case, Mason Nutting, Waterville.
—Coates, Mabel Elizabeth, Minneapolis.
Conser, Charles Calvin, Minneapolis.
—Cook, Belle G., Minneapolis.
Current, John Rees, Home.
—Dahl, Inga, Minneapolis.
Danelz, Herman A., Swift Falls.
Dills, Elmer Leslie, Albert Lea.
Duncan, Urni S., Sisseton, S. D.
Ehrhardt, Christian Adam, New Richmond, Wis.
Fahey, John Joseph, Green Isle.
Fields, Perry Arthur, Blanchard, Ia.
Galvin, William Doan, West Liberty, Ia.
Gillette, Ralph P., Minneapolis.
Hodnefield, Jacob John, Radcliffe, Ia.
Janes, Alex, Pipestone.
Johnson, Oscar Victor, Carver.
Kellogg, Karl Bradley, Rochester.
Lind, Norman George, New Ulm.
McKinnon, Angus McDonald, Crookston.
—Newton, Julia Olive, St. Anthony Park.
—Olson, Nelle A., Zumbrota.
O'Neill, Frank William, Graceville.
—Phelps, Louise, Minneapolis.
Phinney, Barney Orin, Sutherland, Ia.
Ranson, Stephen Walter, Dodge Center.
Reed, Frank Elisha, Glencoe.
—Robbins, Adelalde, Robbinsdale.
Rossman, Willard Allen, Chatfield.
Schunert, Charles Adolph, Minneapolis.
Sherman, John C., Winsted.
Stanley, James Garfield, Minneapolis.
Stevens, Fred Harding Minneapolis.
Stewart, Frederick Alexander, Minneapolis.
Thorp, Henry Joseph, Clyde, Ohio.
—Twamley, Edna, Grand Forks, N. D.
Webster, George Burbank, Minneapolis.
Wedge, Ralph Charles, Plainview.
Weed, Inis, Schoolcraft, Mich.
—West, Ruth, Minneapolis.
—Wheaton, Grace, Minneapolis.
Wyman, James Claire, Minneapolis.
Youngberg, Everett LeRoy, Cannon Falls.

SOPHOMORE CLASS, 246.

CLASSICAL SECTION, 25.

—Arndt, Caroline Agnes, St. Paul.
Austin, Clarence Elliott, Barton, Vt.
—Boutelle, Anna Kimber, Marshall.
Brown, Allan Reginald, Minneapolis.
Burmester, Ernest Adolph, Wells.
—Daly, Alice, St. Paul.
Deering, William Chapman, Minneapolis.
Hanson, Ella Caroline Crookston.
—James, Ursula Marguerite,Minneapolis.
Jones, Benjamin Milton, Fairmount.
—Kennedy, Eileen, St. Paul.
Lavell, Richard Alexander, Fargo, N. D.
—McKeehan, Irene P., Minneapolis.
McLean, Malcolm Appleton, Minneapolis.
Mosher, Esek Ray, Albert Lea.
—Newkirk, Bertha G., Minneapolis-
Pinney, George Graham, Fargo, N. D.
Prouty, Walter DeForest, Minneapolis.
Sverdrup, George Jr., Minneapolis.
Ten Broeck, Robert Carpentar, Faribault.
—Thompson, Marie, Minneapolis.
—Thornton, Mary L., St. Paul.
—Tompkins, Nellie Elizabeth, Robbinsdale.
—Traver, Helen W., Saratoga Springs., N. Y
Waddle, Ralph Henry, Knoxville, Ill.

SCIENTIFIC SECTION. 54.

Alley, Albert Guy, Buffalo.
Bakke, Ole Mathias, St. James.
Barrows, Earle Marsh, Minneapolis.
Bottenfield, Drake, Minneapolis.
—Button, Mary Stewart, Casselton, N. D.
—Cadwell, Carrie M., Le Sueur.
Campbell, Otho Harald, Litchfield.
Chase, Dwight, Lake City.
Chase, Raymond Park, Anoka.
Chernausek, Samuel, Hutchinson.
—Cross, Catharine Mabel, Hudson, Wis.
Danforth, Arthur, Parker, S. D.
—Erikson, Winnifred Boynton, Minneapolis.
—Fagundus, Mary Wilson, Hillsboro, N. D.
Feldman, William E., Arlington.
Gutsche, Edward Jacob, Glencoe.
—Hall, Alice Delia, Zumbrota.
Halvorson, Peter Albert, Dawson.
Haney, Claude Leonard, Minneapolis.
Hegel, Newton, Minneapolis.
—Houlton, Ruth, St. Cloud.
Huff, Ned, Little Falls.
Jackson, Gilbert Morris, St. Paul.
—Johnson, Bessie, Minneapolis.
Johnson, Thorwald Ross, Hampton, Ia.
—Keatley, Sadie Lura, Minneapolis.
Kilbourne, Stanley Shumway, Lisbon, N. D.
Layne, John A., Rushford.
—Lewis, Charlotte. St. Paul.
—McFadden, Esther, Fergus Falls.
—McKittrick, Elizabeth, Minneapolis.
—McVeigh, Elizabeth, Minneapolis.
—Mendenhall, Alice Louise, Minneapolis.
Nelson, Arthur, Red Wing.
—Nelson, Sadie H., Humboldt, Ia.
Newhall, Robert T., Minneapolis.
—Parker, Mary Adeline, Minneapolis.
Putnam, Robert W., Red Wing.
—Ray, Mary Louise, St. Paul.
Rowe, Arthur Nelson, Springfield.
Sanderson, Julius, Anoka.
Sandstrom, John Ferdinand, Benson.
Santee, John H., Fairmont.
Shumway, Royal R., Robbinsdale.
Smith, Elliott, Fairmont.
Smith, Emmett W., St. Paul.
Smith, Fred Le Roy, Waseca.
—Steel, Glenn, Wabasha.
Stockman, August F,, Plato.
Tibbetts, Chester H., Duluth.
Tigue, Francis Henry, Coon Creek.
Tyler, Edwin A., Minneapolis.
—Wagner, Susie A., Minneapolis.
White, Clyde Roy, Pine Island.

LITERARY SECTION, 68.

—Ackerson, Winifred Harriet, Minneapolis.
—Adams, Helen, Minneapolis.
—Ainsworth, Bessie Ella, Chippewa Falls, Wis.
—Armstrong, Harriet, St. Paul.
—Ballard, Gertrude Ellen, Minneapolis.
Bearman, Harry T., Minneapolis.
Blekre, Julia Marie, Mankato.
Bollum, Carl Olaf, Belle Chester.
Brohough, Oscar, St. Paul.
—Chadwick, Grace, Owatonna.
—Clark, Sybil Harriet, St. Cloud.
Cleven, Nels Andrew Nelson, Wist P.O.,S. D.
—Cole Bettie Vivian, Chatfield.
Collins, Stewart Garfield, St. Cloud.
—Cotter, Annette, Austin.
—Dann, Ethel Claire, Clark, S. D.
—Denny, Grace E., St. Paul.
Duval, Mrs. Zoe Hotchkiss, Minneapolis.
Folsom, Claude Miller, Mt. Clemens, Mich.
—Garbett, Louise, Minneapolis.
—Gillis, Mary May, Minneapolis.
—Glasoe, Agnes, Spring Grove.
—Halvorson, Gurinne A., Rushford.
Halvorson, Olof, Norway, Ill.
—Harrington, Josephine Marie, Minneapolis.
—Hayward, Eunice McMillan, Minneapolis.
—Hendrix, Helen Rozette, Minneapolis.
—Hickok, Amy Elmina, Minneapolis.
—Hutchinson, Harriet Jane, Minneapolis.
—Kiehle, Florence E., Minneapolis.
—Knatvold, Ruth B., Albert Lea.
—Koch. Flora Marguerite, Fergus Falls.
—Lavayea, Grace White, Larimore, N. D.
—Liddell, Grace Isadora, Wadena.
Lindeke, Walter F., St. Paul.
—Longbrake, Mary Louise, Minneapolis.
—McFarlane, Lorena M., Minneapolis.
—Mallory, Helen, Minneapolis.
Mann, George D., St. Paul.
—Mann, Leonora C., Minneapolis.
—Marshall, Olive M., Minneapolis.
—Merrill, May, Minneapolis.
—Nelson, Alice M., St. Paul.
—Nelson, Marie L., West Superior, Wis.
—Newman, Marion Kate, Minneapolis.
—Nickerson, Maude, Elk River.
—Parker, Belle Louise, Pickwick.
—Pendergast, Ellen Martha, Hutchinson.
—Perry, Florence, McCloud, St. Paul.
—Petran, Ethel May, Minneapolis.
—Rugg, Virginia. St. Paul.
Schlenbusch, Ernest George, Roland, Ia.
Sigmundstad, Richard, Elmore.

—Sjoberg, Martha, Herberta, Duluth.
—Spear, Ruth Minerva, Minneapolis.
—Spencer, Mildred A., Minneapolis.
—Steele, Katherine Dee, Sandwich, Ill.
—Thompson, Alice E., Minneapolis.
—Tisdale, Isabel A., St. Anthony Park.
—Truax, Emma Leoline, Hastings.
—Walker, Abbie, G. F., Minneapolis.
—Weaver, Jessie I., St. Paul.
—Webster, Corrinne, Minneapolis.
—Wheeler, Cleora, C., St. Paul.
—Whittemore, Josie M., Elk River.
—Wier, Amelia L., Stillwater.
—Willcuts, Indianola, Duluth.
—Zehnter, Ruby Pauline, Minneapolis.

CIVIC SECTION, 83.

—Amunds, Nora Estella, Minneapolis.
—Andrews, Dolly Sarah, Minneapolis.
—Babcock, Ruth Eloise, Winona.
Baily, Seavey Moor, Minneapolis.
—Baker, Augusta Emma, Austin.
Benson, Clarence Herbert, Minneapoiis.
Barnard, Robert Tatlow, Minneapolis.
Bingham, William Eugene, Sleepy Eye.
Borrowman, George Leonard, Stillwater.
Bray, Elwyn Royal, Excelsior.
—Buchanan, Mae, Minneapolis.
Burglehaus, Geo. Rufus, Minneapolis.
Burns, Keivin, Brainerd.
Byron, William Brayton, Minneapolis.
—Campbell, Harriet Louise, Alexandria.
—Chapman, Anna Field, St. Paul.
Clapp, Harvey Spaulding, St. Paul.
Cull, John Arthur, St. Thomas, N. D.
—Dinsmoor, Jessie Belle, Austin.
Drake, Benjamin F. Jr., Maple Plain.
Duncan, James Floyd, Sterling, Nebr.
—Dyar, Alice Emma, Winona.
—Edwards, Flora Alice, Minneapolis.
Feroe, Helmer Mathias, Hazel Run.
—Fletcher, Maude Rena, Minneapolis.
Freeman, Perley L., Springfield, Ill.
Frykman, Bror Gustaf, Kerkhoven.
—Fuller, Florence Lenora, Crookston,
Goodwin, Harry James, Appleton.
—Hanneman, Susan Ernestine, Northfield.
Hansen, Nicholas, Minneapolis.
—Harris, Martha Fallis, Minneapolis.
Ives, Henry Swift, St. Peter.
—Joslin, Sarah Harrold, Moline, Ill.
—Judson, Leulah, Dobbs Ferry, N. Y.
—Kasper, Evelyn Leone, Glencoe.
—Kennedy, Cornelia, Minneapolis.
—Klopp, Nancy Kathryn, Esterville, Ia.
Knight, Ray Roberts, Minneapolis.
Ladd, James B., Sanborn.
Ladd, Sumner M., St. Peter.
McMillan, Putnam Dana, Minneapolis.
Magnuson, Mark G., Merriam Pk.
Mallory, Earl P., Brainerd.
Martin, James McG., Minneapolis.
—Mersen, Alice Margrett, Hutchinson.
Metcalf, James N., Minneapolis.
—Middleton, May, Jamestown, N. D.
Miller, Sylvia E., St. Paul.
Neerland, Ingvald, Minneapolis.
Nicholas, Edwin Herbert, Fairmont.
—Nind, Helen M., Minneapolis.
Norton, Willis I., Marshall.
—O'Gordon, Hannah, Sacred Heart.
—Peck, Sara Louise, Faribault.
—Pond, Frances Eggleston, Minneapolis,
—Purcelle, Anastasia M., Minneapolis.
—Reid, Eva Christie, Minneapolis.
Ricks, William L., Iowa Falls, Ia.
—Robb, Laura M., Minneapolis.
Seaton, Charles Henry, Winamac, Ind.
Seaton, Frank Winslow, Winamac, Ind,
Shaw, Frank G., Minneapolis.
Simmons, Jesse, Austin.
—Sinclair, Agnes Winifred, Fairmont.
—Slack, Marie Louise, St. Paul.
Steinberg, Louis R., Mason City, Ia.
—Stockton, Glennie Bacon, Faribault.
—Stone, Elsie A., Minneapolis.
Sutton, Eli, Brownville.
Thelen, John N., Stillwater.
—Turner, Mary, Little Falls.
Turner, Ralph Clark, Winona.
Veldey, Tedlef, Hanley Falls.
—Vernon, Mabel C., St. Paul.
—Watson, Harriet, Sauk Rapids.
Wedge, Wayne W., Plainview.
Wells, Homer De V., Montevideo.
—Wentworth, Hattie Ellen, Minneapolis.
Wildey, Herbert Leslie, Anamosa, Ia.
Williams, James Von, Marshall.
Wold, Carl John Adolph, Minneapolis,

TEACHER'S SECTION, 16.

—Bowler, Katherine Clara, Bird Island.
—Burnham, May Dora, Minneapolis.
—Cheney, Lida Pearl, Appleton.
—Claypool, Jennie Leona, Spencer, Ia.
Eastby, John M., Madison.
Emerson, Byron Todd, Brandon.
—Englund, Ida Albertina, Alexandria.
—Finch, Alice Maude, Clinton Falls.

—Hocanzon, H. Esther, St. Paul.
—Jacobson, Katherine. St. Paul.
—McGillis, Annie, Minneapolis.
—Muedeking, Galena, Owatonna.
—O'Neill, M. Gertrude, St. Paul.
—Sand, Anna, Elbow Lake.
Van Camp, Kate, Austin.
—Ziegler, Augusta G., Gaylord.

FRESHMAN CLASS, 372.

CLASSICAL SECTION, 25.

Bockman, Sigurd, Minneapolis.
Choate, Isaac Watts, Minneapolis.
—Cole, Marion Alice, Minneapolis.
—Cook, Amy J., Sioux Falls, S. D.
Firkins, Chester, Minneapolis.
—Fiske, Mary Ednah, St. Paul.
—Fleming, Mabel Clare, Minneapolis.
—Frye, Anna Marion, St. Paul.
Fuller, Almond Phillips, Stockholm, S. D.
—Hubbell, Mina Elizabeth, Minneapolis.
—Hull, Clara Blanche, St. Paul.
—Ives, Agnes, St. Paul.
LeTourneau, Edward Harold, Duluth.
—Littlefield, Lura May, Minneapolis.
—Ludwig, Ada Jerusha, Minneapolis.
—McMillan, Ethel May, Minneapolis.
Mills, William, Minneapolis.
Mitchell, Harry Sewall, Minneapolis.
—Olds, Nina Delia, Minneapolis.
Peterson, Philip Henry, Maple Plain.
Pingry, Frank Richardson, Minneapolis.
Plummer, Harry Levinne, Minneapolis.
—Root, Alice Gardiner, St. Paul.
Severson, Samuel Ole, Norden, S D.
Stone, George Hartwell, Minneapolis.

SCIENTIFIC SECTION, 98.

—Ames, Elizabeth Harriet, Litchfield.
Asher, Allen Preston, Granite Falls.
Aygarn, Martin Hallock, Choice.
—Baker, Ruth Trueman, Granite Falls.
Barnum, Cyrus Paine, Minneapolis.
Blanchar, Clarence Leroy, Welcome.
Bodien, Victor Emanuel, Minneapolis.
—Bolin, Mamie Anglim, Brainerd.
—Bollinger, Virginia, St. Paul.
Bolstad, Alfred C., Dawson.
Boraas, Ingmar J , Hader.
—Bowman, Bessie Emily, Duluth.
—Bradford, Eva Austin, Empire.
—Bradford, Fanny Paine, Empire.
—Bryden, Mabel Clare, Rushmore.
Casey, Martin Joseph, Jordan.
Child. Clyde Roy, Waseca.
Corl, John Swinborne, Minneapolis.
—Cornwell, Georgie Florine, Little Falls.
Cosgrove, Joseph Henry, Montevideo.
Covey, William Sumner, Minneapolis.
—Dorsett, Harriet Ann, Minneapolis.
Dungay, Neil S., Faribault.
Evanson, Edward Antonio, Minneapolis.
Fish, Horace Porter, Minneapolis.
—Fitzgerald, Sadie Monica, Litchfield.
Flannery, Henry Clay, Minneapolis.
—Fleming, Winnie Avis, St. Paul.
Francis, Harry Edwin, Minneapolis.
Frisbee, Willis Haseltine, Sheldon, Ia.
—Frost, Mabel Blanche, Norway; Mich.
—Fuller, Bertha, Grand Rapids.
Glass, Courtney T., Luverne.
Goodsell, Clarence W., Flandreau, S. D.
—Griswold, Grace Italia, Dodge Center.
Hammerel, Ambrose Lewis, St. Cloud.
Hauck, Herbert Matthew, Le Sueur.
Haverson, Geo. Bennett, Merriam Park.
—Hayden, Ethelwyn, Minneapolis.
Haynes, Donald Edwin, St. Paul.
Henderson, Melvin Starkey, St. Paul.
—Hillesheim, Anna, Sleepy Eye.
—Hillesheim, Mary Josephine, Sleepy Eye.
Hovday, Olaf, Duluth.
—Hurd, Ina Frances, Minneapolis.
—Jenks, Grace Mae, Wells.
—Jensen, Dagmar Christence, St. Paul.
Johnson, Arthur Monrad, Warren.
Johnson, Lloyd, Minneapolis.
Kells, Lucas Carlisle, Sauk Center.
Kelsey, Carleton Gale, Minneapolis.
—Koehler, Nora Evelyn, Zumbrota.
Kovarik, Alois Frenciscus, Spilliville, Ia.
—Kraft, Mary Helen, Minneapolis.
Kranz, James Philip, Hastings.
—Lange, Mary Reno, Petersboro N. H.
Leach, Hugh Elis, Spring Valley.
Lewis, Roy Vivan, Worthington.
—Linkfield, Alice Ernestine, Minneapolis.
Loomis, Earl Alfred, Owattona.
Lowry, Samuel Doak, Austin.
—McLachlan, Ellen, Glenwood.
McMahon, Charles, Ellsworth.
—McPartlin, Catherine, Glencoe.

—Malmsten, Agnes Theresa, Minneapolis.
Martin, Thomas Roy, Mantorville.
Morgan, George Wagner, Minneapolis.
Newhall, Norman Leslie, Minneapolis.
—Oberg, Marie Josephine, Litchfield.
—O'Brien, Elizabeth, St. Paul.
—Olson, Deva Mae, Minneapolis.
Oman, Alfred Edward, Hastings.
Panzram, Herman August.
Paris, Clarence Hiram, Winona.
Pennock, Edward McMaster, Minneapolis.
Peters, LeRoy, St. Joseph, Mich.
Pierce, Clifford Vivian, St. Paul.
Pierce, Ernest Boynton, St. Paul.
Pond Samuel Benjamin, Minneapolis.
Rice, Arthur Nelson, Adrian.
—Sahlbom, Eureka Amelia, Org.
—Seeley, Harriet, Minneapolis.
—Smith, Hortense M., Algona, Ia.
Smith, Roy Leslie, Villard.
Sogge, Ludwig Larson, Jackson.
—Stebbins, Lillian Brownnell, Minneapolis.
Stevens, Fred Walter, Minneapolis.
—Stone, Lilla Grant, Minneapolis.
—Swift, Carrie, Osseo.
Trutna, Thomas J., Silver Lake.
—Utley, Lillie Exceene, Preston.
Van Campen, Benjamin Henry, Cannon Falls.
Varco, Albert Raymond, Austin.
Vickerman, Edward Toppen, Jasper.
—Wagen, Alma Dorothy, Mankato.
Will, Will Wallace, Mapleton.
—Wright, Daisy Mabel, St. Paul.
—Yager, Mary, Preston.

LITERARY SECTION, 123.

—Aldrich, Helen Jane, Denver, Colo.
—Alexander, Sara, Lake City.
—Ames, Marion Hall, Minneapolis.
—Anderson, Mary, Minneapolis.
—Ansley, Florence Remsen, Hudson, Wis.
Arnold, Morris LeRoy, Minneapolis.
—Bakke, Anna Helen, St. Louis Park.
Banfield, Nathan Fiske, Jr., Austin.
—Bay, Alma, St. Paul.
—Bean, Alice Annette, New Prague.
—Beede, Ethel Remington, Minneapolis.
—Bevans, Edna Grace, St. Paul.
—Birnberg, Margaret Rebecca, St. Paul.
—Bodenstedt, Eleanor Methilde von, St. Paul.
—Boyson, Christine Holmes, Minneapolis.
—Bridgham, Leola Frances, Minneapolis.
—Brohaugh, C. Mary, St. Paul.
—Brown, Ruth Alberta, Minneapolis.
—Brown, Winifred Elizabeth, Minneapolis.
—Bruhn, Louise Hedwig, Morris.
—Brunner, Camila, Peru, Ill.
—Buell, Ella Louise, Minneapolis.
—Burgess, Florence, Eagle Lake.
—Burwell, Louise, Minnetonka Mills.
Byard, Lee Brooks, Minneapolis.
—Carpenter, Bessie, Sauk Center.
—Clancy, Margaret Agness, St. Paul.
—Cole, Ruth Law, Minneapolis.
—Collins, Ada Fae, Minneapolis.
—Cooper, Myrtle Ida, Redwood Falls.
—Cotter, Mary Scholastica, Austin.
—Cunningham, Grace Irene, Minneapolis.
—Daum, Esther Kathlyn, Minneapolis.
—Davis, Scottie Primus, St. Paul.
—Dean, Agnes Louise, Minneapolis.
Dibble, Walter Gordon, St. Paul.
—Dinsmoor, Marian Ethel, Austin.
Drake, Clarence Evertte, Mitchell, Ia.
—Duensing, Minnie, Minneapolis.
—Earhuff, Charlotte May, North St. Paul.
—Easton, Leora, Warren.
—Easton, Susie Katherine, Warren.
—Eddy, Ella, Montevideo.
—Everington, Gertrude Minerva, Minneapolis.
—Farnsworth, Florence, St. Paul.
—Fawcett, Anna Arksey, Windom,
—Feeley, Mary Corinne, St. Paul.
—Fisk, Florence Rumley, Helena, Mont.
—Foulke, A. Elsie, St. Paul.
—Garrow, Lillian Bird, St. Paul.
—Gilbert, Nellie Mae. Rochester.
—Gould, Laura, Minneapolis.
—Griffith, Helen, Minneapolis.
—Halvorson, Ella Josephine, Dawson.
—Harris, Marian Jane, Lake City.
—Hartney, Katherine Wellworth, Maynard.
—Hiscock, Jennie Isabelle, Minneapolis.
—Holly, Clara May, Peru, Ill.
Horigan, Bartholomew Bert, Morris.
—Houck, Edna Christina, Preston.
Howard, Byron Sewell, Duluth.
—Hull, Mabelle Catherine, Minneapolis.
—Hyser, Alice Maude, Minneapolis.
—Ives, Agnes Sherwin, St. Paul.
—Johnson, Florence Edna, Minneapolis.
—Johnston, Emily Lydia, Minneapolis.
—Jones, Marion Isabelle, Minneapolis.
—Kanneberg, Ella, Ashland, Wis.
—Kapp, Kate, Dubuque, Ia.
—Kentner, Mattie Genevieve, Dawson.
Kirsch, Arthur Henry, Crookston.

—Klein, Laura E., Mankato.
—Lamphere, Eugenie Margaret, St. Paul.
—Leonard, Ruth, Minneapolis.
—Leveroos, Emma Caroline, St. Paul.
—Lucker, Clara Antoinette, Minneapolis.
—McCarriel, Myra, Princeton.
—McCarthy, Mae Elizabeth, St. Paul.
—McCurdy, Myrtle Belle, Minneapolis.
—McCurdy, Mattie Pearl, Minneapolis.
—McFarlane, Charlotte Mary, Minneapolis.
—McKercher, Margaret Amelia, Minneapolis.
—McNair, Nora, Minneapolis.
—Mannheimer, Elesa, St. Paul.
—Marks, Minnie, Moorhead.
—May, Grace Jane Lovell, St. Paul.
—Mercer, Iva Esther, Minneapolis.
Monten, William Andrew, Fargo, N. D.
—Moore, Edith Randall, St. Paul.
—Norby, Leonore Theresa, Detroit.
—Northrup, Jessie Eastman, Plattville, Wis.
—Norton, Mayme Louise, Minneapolis.
Nye, Marshall Albee, Minneapolis.
—O'Brien, Harriet, Minneapolis.
—Oliver, Myrtle Talbot, Garden City.
Olsen, Henrik Wergeland, Minneapolis.
Olson, Alfred Louis, Stoughton, Wis.
—Parker, Alice Margaret, Minneapolis.
—Pratt, Prudence Emily, Minneapolis.
—Preble, Nora, Hastings.
—Putnam, Edith Elizabeth, Minneapolis.
—Redfield, Alice W., Minneapolis.
—Richardson, Iva Myrtle, Elgin.
—Rosholt, Lillian Ruth, Minneapolis.
—Rueth, Agnes Teresa Eugenia, St. Paul.
—Scripture, Bessie Byrona, Minneapolis.
—Shedorsky, Sarah, St. Paul.
—Sheldon, Eleanor Augusta, Minneapolis.
—Spaulding, Mariette Berry, Mapleton.
—Sweet, Bessie Lucretia, Minneapolis.
—Swenson, Rhoda, New London.
—Tennison, Agnes Ada, Minneapolis.
—Thomas, Josephine, Minneapolis.
Thompson, C. Joseph, St. Paul.
—Thompson, Gladys, St. Paul.
—Thornton, Margaret Amelia, St. Paul.
—Torrance, Hester May, Minneapolis.
—Towle, Mabel Merithew, Minneapolis.
—Waggoner, Ara Elsie, Bismarck, N. D.
—Wagner, Ivy Etta, Moorhead.
—Washburn, Grace Emma, Minneapolis.
Weir, Sue Allen, Minneapolis.
—Woodworth, Loella, Minneapolis.

CIVIC SECTION, 126.

—Alden, Mary M.. Minneapolis.
Alexander, Fred Azen, Kasson.
Anderson, Louis Peter, Minneapolis.
Asseln, Henry, Minneapolis.
Baker, Merton Franklin, Elgin.
Barteau, Fred, Minneapolis.
Bartleson, Charles Albert, Minneapolis.
—Beeson, Alta Adeline, Worthington.
Bennett, Charles Edward, Granite Falls.
—Bennett, Mary Lillian, Faribault.
—Benson, Mattie Anna, Faribault.
Booth, Robert Kendall, Winona.
—Broderick, Marian Josephine, St. Paul.
Brooks, Paul Andros, Minneapolis.
—Bruce, Hellen Mary, St. Paul.
—Burbridge, Helen Pauline, Minneapolis.
—Carter, Alice Eller, Minneapolis.
—Christopherson, Clara Sophia, Faribault.
Churchill, Irwin Allen, Rochester.
—Cole, Marjorie Helen, Minneapolis.
Coleman, Frank Daniel. Ellendale, N. D.
Collins, Louis Loren, St. Cloud.
Collins, Richard Delos, Windom.
—Colter, Ester Helen, St. Paul.
—Constance, Molly Millicent, Hopkins.
Cotton, Isaac Franklin, Fredericksburg, Ia.
—Craig, Agnes Somerville, Minneapolis.
Cutting, Ellsworth Alphonso, Sleepy Eye.
—Docken, Elizabeth Glassford, Edina Mills.
—Douglas, Edna Grace, Winona.
Dye, John Walter, Winona.
—Eaton, Mabel, Minneapolis.
Edwards, Harrison Elmer, Ashland, Wis.
Eide, Carl John, Minneapolis.
Feely, Thomas James, Farmington.
Fisk, James Kennett, Helena, Mont.
Ford, Allyn Kellogg, Minneapolis.
—Foster, Pauline B., Minneapolis.
Frankberg, George Walter, Fergus Falls.
Gallagher, Richard, Anoka.
Gauger, Edward, St. Paul.
Gibbons, Archibald Ray, Austin.
Gislason, Arnie B., Minneota.
—Gordon. Bessie LeDema, Minneapolis.
Hall, John Oscar, Diamond Bluff, Wis.
Halloran, Matthew William, Chatfieid.
Hammand Orville Adelbert, Spencer, Ia.
—Harholdt Marie, St. Paul.
Hayward, George Irwin, Pine Island.
—Hedemark, Lena Matilda, Minneapolis.
—Herbst, Edith Gertrude, Osakis.
—Higginbotham, Blanche Oves, Minneapolis.
Holm, John G., Minneota.
—Ives, Mary, St. Paul.
tacobsen, Leonard Harold, Luverne.
Jacobson, Martin Ludwig, Slaton.

—Janney, Emily Florence, Minneapolis.
Jensen, Jes Peter Frederik, Hutchinson.
—Jewett, Gertrude Ellen, St. Paul.
—Jones, Edith Evelyn, Faribault.
—Joy, Lillias Anne, St. Paul.
Keyes, Robert Howard, Minneapolis.
King, Francis LeRoy, Ellendale, N. D.
Lamberton, Frank Sylvester, Winona.
—Langlois, Alice, Minneapolis.
—Lucas, Rena Avis, Minneapolis.
—Ludwig, Corabelle, Minneapolis.
MaCcallum, James, Minneapolis.
—McDonough, Julia Genevieve, Butterfield.
McGrath, William Henry, Waverly, Ia.
McManigal, Willian Allison, St. Paul.
McNeil, Edwin Colyer, Alexandria.
Maland, Clarence, Rushford.
Matthews, Lillian, Sioux City, Ia.
Miller, Frederick Caspar, St. Paul.
Morken, Gilbert Theo, Kragness.
Morton, William Eugene, Minneapolis.
—Mulvihill, Annie Irene, Minneapolis.
Nichols, Earle Henry Scott, Blue Earth.
Noehl, Bartley F., Kasson.
Norton, Frank Egbert, Marshall.
Olson, Hans M., Belleview.
—Page, Mary Eliza, Minneapolis.
Pattee, Richard Storrs, Minneapolis.
Patten, Burl Sherman Wright, Pipestone.
—Patten, Florence Amelia, Morton.
Pehonshek, Chas., Minneapolis.
—Peteler, Gertrude May, Minneapolis.
Peterson, Horace, Worthington.
Pierson, Roy N., Minneapolis.
Poppe, Frederick Harold, Milbank, S. D.
Powell, Lee Marsden, Montgomery.
Praxel, Anthony Joseph, Lamberton.
Quinn, Vernon Tilden, Lamberton.
—Reimbold, Henrietta Maria, St. Paul.
Remele, Albert Charles, Evan.
Rickard, Truman Elwell, Minneapolis.
Roberts, Robert Ap., River Falls, Wis.
—Roth, Bertha Pauline, Faribault.
—Schutt, Alma Jean, Minneapolis.
Schwartz, Barney Levy, Gowanda, N. Y.
Shuck, Warren Ellsworth, Rushmore.
—Skoog, Artie Nettie, Red Wing.
—Smith, Lillian M., Minneapolis.
Spring, Elbert Webster, Minneapolis.
Stamm, Albert Gottfried, St. Paul.
Stevens, Charles Sidney, Farmington.
—Stevenson, Mabel Cordelia, Minneapolis.
Stevenson, William Claude, Minneapolis.
Strathern, M. Lane, Rich Valley.
—Teeter, Jenny Lind, Minneapolis.
—Thompson, Edith Lillian, Minneapolis.
Welles, Albert Byron, Minneapolis.
Welles, Leonard Robbins, Minneapolis.
Weum, Thurston William, Moorhead.
Whited, Oric Ogilvie, Minneapolis.
—Whittier, Beryl Estelle, Minneapolis.
—Whittier, Bessie Mabelle, Minneapolis.
Ward, George Westerfield, Alexandria.
—Wayne, Alta M. Minneapolis.
—Van Bergen, Margaret Phipps, Minneapolis.
Volk, Henry William, Lake Washington.

UNCLASSED STUDENTS, 123.

Allen, Edwin G., Duluth.
Allis, Roy Wirt, Oronoco.
—Anderson, Hilvine, Minneapolis.
Anglim, William George, Crookston.
—Avery, Bertha C., Minneapolis.
Bacon, Elbridge, Minneapolis.
—Barstow, Esther, Minneapolis.
—Bedford, Bessie Lillian, Rushmore.
—Bennett, Jane Prescott, Minneapolis.
Berg, Peter E., Watertown.
—Billings, Maude, Minneapolis.
—Bonness, Florence, Minneapolis.
—Bonness, Mabelle Edna, Minneapolis.
Buckley, Nellie A. Farmington.
—Butler, Anna, Minneapolis.
—Carel, Mrs. Hubert C., Minneapolis.
—Catlin, Alice, Minneapolis.
—Chase, Olive Edna, Stanton, Neb.
—Cook, Charlotte Everett, Greenwood, S. D.
—Cook, (Mrs.) Julia M., Minneapolis.
—Coward, Eleanor, Marston, England.
—Crosby, Caroline Macomber, Minneapolis.
—Dawes, Effie Viola, Minneapolis.
—De Laittre, Sarah Oliver, Minneapolis.
—Derrick, Maude Burnice, Minneapolis.
Donaldson, Francis A. Jr., Philadelphia, Pa.
—Eaton, Narcissa Beatrice, Minneapolis.
Ecklund, Edward Alford, Minneapolis.
—Eddy, Esther, Minneapolis.
—Eichelzer, Harriet Gregory, Minneapolis.
Elskamp, Leo, Minneapolis.
—Elwell, Annabel, Minneapolis.
—Fargo, Wyona Lenore, Hartford City, Indiana.
—Fisher, Dora Maud, Long Prairie.
Flitner, Charles Edward, St. Paul.
Garkett, Benjamin, Minneapolis.
Garnes, John Seaman, Des Moines, Ia.
—Gray, Julia Ellen Man, Minneapolis.
—Grum, Paula, Minneapolis.
Gustin, R. D., Minneapolis.
—Guthrie. Mrs. Rhoda E., Minneapolis.
—Hammond, Florence, Minneapolis.
Hanche, Charles F., Chicago, Ill.

Harrington, Michael Joseph, Avoca.
—Hawes, Hattie Maria, Minneapolis.
—Hawk, Ella M., Redwood Falls.
—Hazen, Maud Bradford, Minneapolis.
—Henriksen, Marie, Ossian, Ia.
Hicks, William Charles, Au Sable, Mich.
Hoefod, Herman Olaf, Ashby.
—Hoff, Magda Matilda, Dalton.
Holt, Charles Mead, Minneapolis.
—Holt, Mrs. Lulu Maude, Boston, Mass.
—Hosmer, Alice May, St. Paul.
Howells, Samuel Morris, Wilmot, S. D.
—Hubbard, Florence Margaret, Spencer, Ia.
--Huffman, Emma F., Perry, Ia.
—Humphreys, Helen, Minneapolis.
Jamieson, Scott John Baird, Rapidan.
—Johnson, Effie Matilda, St. Peter.
Johnston, Louis Harold, Minneapolis.
Joyce, Arthur Reamy, Minneapolis.
Judd, George Marvin, St Paul.
Kinder, Louis B., Duluth.
—Kremer, Mary Lillias, Minneapolis.
Lange, Deidrich, St. Paul.
Lawrence, C. Wyman, Wabasha.
—Lee, Sarah O., Wilberforce, O.
Lewis, Carl Henry, Sparta, Wis.
—Lewis, Laurel, St. Paul.
—Liggett, Madeline M., St. Anthony Park.
—Lord, Inez, Helen, Minneapolis.
—Lovell, Lela Elma, Jamestown, N. D.
—Lucas, Mrs. Leonora B., Minneapolis.
—Lynn, Blanche G., Grand Harbor, N. D.
—McDennott, Marie A., Minneapolis.
—McFetridge, Margaret Euphemia, St. Paul
McGuire, Walter Perry, Ames, Iowa.
McKaig, Hugh Carl, Minneapolis.
—McLaughlin, Elizabeth, Mapleton.
McKenney, Richard Irving, N. St. Paul.
Merrill, Sidney B., Glendale.
—Miller, Mrs. May Chace. Minneapolis.
Mitchell, Dick, Barr. Ill.
Moore, May, Minneapolis.
—Morgan, Rose, New Whatcom, Wash.
Nelson, Nels P. B., Rosendale.
Norris, Georgia, Minneapolis.
Nordvedt, Emeline Hannah, Canton, S. D,
—O'Hearn, Juliett, Minneapolis.
—Pabody, Eleanor, Minneapolis.
Patterson, Frederick Charles, Minneapolis.
—Perl, Hildergarde, Duluth.
—Pearce, Mabelle, Minneapolis.
—Perry, Lucy, Minneapolis,
—Ray, Alice Paull, Minneapolis.
—Renner, Anna Laura, Preston.
Ressler, Rex Lambert, Minneapolis.
—Robertson, Altis Louise, Minneapolis.
—Robinson, Harriet May, Rochester.
—Ruscoe, Mrs. Ella Cole, St. Paul.
Saetveit, Torbjorn, Marshfield, Wis.
—Salisbury, Carolyn Tyler, St. Paul.
Scott, Helen Blevin, Minneapolis.
Schuetz, Darwin, New Ulm.
—Sheldon, Harriet Patterson, Red Wing.
—Spencer, Adele May, Minneapolis.
—Tennant, Lois Agnes, Minneapolis.
—Thompson, Jessie Sara, Faribault.
—Thompson, Eva F., St. Paul.
—Thompson, Leola Rosa, St. Paul.
—Trask, Avery, Minneapolis.
—Trask, Grace Eugenia, Minneapolis.
—Warner, Alice, Minneapolis.
Warvelle, Francis Gurrie, Kenosha, Wis.
—Wheeler, Carrie, Minneapolis.
—White, Sara Abott, Minneapolis.
Williams, Warren O., West Concord.
--Woodruff, May E., Minneapolis.
—Woodcock, Bessie Marie, Minneapolis.
Williams, Frederick Travis, Minneapolis.
Wiren, Oscar Bernnedotte, Minneapolis.
—Young, Blanche, Minneapolis.
Young, Charles Edward, Elgin, Ill.
Yount, Jesse Lansing, Anamosa, Ia.
Yerxa, Dwight Keyes, Minneapolis.
Youngquist, Chas, Minneapolis.

SCHOOL OF CHEMISTRY.

SENIOR CLASS, 1.

Martin, Arthur W., St. Paul.

JUNIOR CLASS, 4.

Benner, Raymond Calvin, Sauk Center.
Fox, George Everett, Minneapolis.
Lando, Maximillian Nandor, St. Paul.
Rice, Edgar Whitman, Minneapolis.

SOPHOMORE CLASS, 1.

Rose, Anton Richard, Maride, Minn.

FRESHMAN CLASS, 4.

Benner, Winthrop Webster. Sauk Center.
Grout, Frank Fitch, Rockford, Ill.
Hopkins, Joseph Irwin, Bloomington.
Nelson, Frank Leonard, Albert Lea

COLLEGE OF ENGINEERING AND THE MECHANIC ARTS.

SENIOR CLASS, 15.

CIVIL ENGINEERS, 5.

Everington, James Wright, Minneapolis.
Gunstad, Iver, Detroit.
Klemer, Frank Henry, Faribault.
Quense, John, New Ulm.
Strate, Thomas Henry, Moorhead.

MECHANICAL ENGINEERS, 2.

Robertson, Phillip Waters, Minneapolis.
Wilson, Eliel F., Minneapolis.

ELECTRICAL ENGINEERS, 8.

Anderson, Martin E., Decorah, Ia.
Blake, Henry Barnard, St. Anthony Park.
Danner, Jake, Minneapolis.
Houlton. Amos, Elk River.
Houts, Guy Joseph, Minneapolis.
Newhall, William B., Minneapolis.
Reque, Styrk Gerhard, Spring Grove.
Tullar, Charles Edward, Warren.

JUNIOR CLASS, 43.

CIVIL ENGINEERS, 19.

Allee, David Arthur, Minneapolis.
Buenaventure, Joaquim Martino, Equador.
Carr, Harvey Chandler, St. Paul.
Chubb, Charles E., Algona, Iowa.
Davison, Joseph Henry, St. Paul.
Downing, Frank Eugene, St. Charles.
Dugan, Edward J., Minneapolis.
Hallan, Christian, Underwood.
Hill, Arthur Delos, Red Wing.
Houston, George Somerville, Minneapolis.
Knowlton, Warren Cumings, Minneapolis.
Lambert, Fred Theodore, St. Paul.
McClelland, Claude Leslie, Clark, N. D.
Segur, Benjamin Frank, Tracy.
Stewart, Clarence H., St. Paul.
Taylor, Carl von Fridagh, St. Paul.
Veharen, Arthur Ward, Spencer, Ia.
Weston, William Snow, Faribault.
Woodford, George Brown, Winchester, Ky.

MECHANICAL ENGINEERS, 10.

Acomb, William Edward, Minneapolis.
Bean, William Loyd, Brainerd.
Cook, Robertson, Minneapolis.
Erickson, Carl Gunnard, Minneapolis.
Grimshaw, William Elwood, Minneapolis.
Herrick, Carl Albert, Minneapolis.
Ramstad, Edward Carl, Eau Claire, Wis.
Stone, Melvin Oscar, Minneapolis.
Sudheimer, Edward Lawrence, Hamline.
Taylor, Ralph George, Minneapolis.

ELECTRICAL ENGINEERS, 14.

Cotton, Charles Sumner, Friendship, N. Y.
Beaulieu, Richard L., St. Paul,
Burns, Harvey Lynn, Merton.
Eberhard, Otto Immanuel, Milaca.
French, Edwin Linton, Minneapolis.
Kreger, Alanson James, Le Sueur.
McPherson, William Butler, Stillwater.
Pohlman, Henry William, Huffton, S. D.
Rosok, Peter Adolph Marius, Minneapolis.
Spence, William James, La Crosse, Wis.
Sykes, Edmond T., Minneapolis
Turner, Charles Huntington, Fenton, Mich.
Waldron, Carl George, Minneapolis.
Warren, Joseph Henry, Minneapolis.

SOPHOMORE CLASS, 69.

CIVIL ENGINEERS, 25.

Anderson, Claude Amelius, St. Paul.
Atkinson, Jesse Campbell, White, S. D.
Barlow, Harry Elmore, St. Paul.
Bennett, Walter James, Minneapolis.
Beyer, Theodore Alexander, St. Paul.
Butler, Millard Angle, Minneapolis.
Casseday, Edgar Darius, Rochester.
Fernald, Frank Osborne. St. Paul.
Grow, Harry Allen, Dawson.
Hickok, Harvey Martin, Minneapolis.
Madden, Francis M., Minneapolis.
Monty, Frank, St. Paul.

Nelson, Elmer J., Center City.
Novig, Ole Lendahl, Minneapolis.
Nutter, Frank H., Minneapolis.
Ober, Walter Marion, Duluth.
Oltman, Charles A., Ellsworth, Wis.
Palmer, George Bushnell, Minneapolis.
Prendergast, Arthur, St. Paul.
Robbins, Orison B., St. Paul.
Root, Alexander, B., Emerson, Manitoba.
Rothi, Paul, Moland.
Schulte, Ross, Santa Cruz, Cal.
Smith, Leighton, St. Paul.
Smith, Raymond, Rochester.

MECHANICAL ENGINEERS, 25.

Andrews, George Luther, Green Valley.
Avery, John Woodbridge, Minneapolis.
Bates, Albert Henry, St. Louis Park.
Bean, Guy Myron, Brainerd.
Bouman, Bernhard Martin, Murdock.
Bradford, Henry Beckler, Empire.
Brown, Albert Blair, Emmetsburg, Ia.
Clipfell, Carroll Dall, Redwood Falls.
Crounse, Avery Fitch, Minneapolis.
Davis, Gilbert Norton, Minneapolis.
Doud, Arthur Thompson, Winona.
Doughty, Mattison Henry, White, S. D.
Fager, Simon Rudolph, Minneapolis.
Garbett, Fred Arthur, Minneapolis.
Graham, Eugene Clayton, Dundas.
Grant, Willis Walker, St. Paul.
Harkee, Otto Fred, Mankato.
Kjosness, Ingram Gerhard, Madison.
McCollom, William H., Minneapolis.
Moore, William Cole, Minneapolis.
Peterson, John N., Litchfield.
Rydeen, Grancis G. A., Minneapolis.
Smith, Justin VanderVelde, Pekin, Ill.
Van Duzee, Edward Maddock, St. Paul.
Wood, William Robert, St. Paul.

ELECTRICAL ENGINEERS, 19.

Benedict, George Frederich, St. Paul.
Brooke, Charles Walter, St. Paul.
Dibble, Barry, St. Paul.
Hughes, Frank Charles, Bismark, N. D.
Laird, Lee R., Wilmot, S. D.
Maley, Levi William, Zumbrota.
Miller, Lucius W., Red Wing.
Page, Mark L., Minneapolis.
Rask, Louis G., Caledonia.
Schumacher, John H., Minneapolis.
Schwarz, John Nichols, Stillwater.
Smith, Clinton Besley, Minneapolis.
Stanton, Chas. J., Sauk Rapids.
Vincent, Jay C., Minneapolis.
Vorum, Andrew, Farmington.
Westlake, John Ellis, St. Paul.
Whitney, John H., St. Paul.
Wicks, John Tyler, Minneapolis.
Williams, Edward Hale, West Cedar Lake.

FRESHMAN CLASS, 95.

CIVIL ENGINEERS, 30.

Acton, Robert William, Madison.
Baihly, Moses Daniel, Rochester,
Baldwin, Ralph Harvey, San Bernardino, Cal.
Bogue, Nathan Herschel, Castle Rock.
Bowen, Fred Pabst, St. Paul.
DeKay, Charles Albert, Morris.
Doherty, Walter Anthony, St. Paul.
Enger, Melvin Lorenius, Decorah, Ia.
Feyder, Wm. Henry, St. Paul.
Frost, Edwin Colby, Norway, Mich.
Gillette, George Davis, Minneapolis.
Gregg, Tresham Dawes, Minneapolis.
Groth, William Charles, Preston.
Hanson, Henry Alexander, Fergus Falls.
Hopeman, Albert Manns, Preston.
Johnson, Nels, Preson.
McMillan, Franklin R., Luverne.
Mason, Charles Haynes, St. Paul.
Matthews, Abner Justus, Ortonville.
Nelson, Nels Benoni, Preston.
Peterson, Arthur Theodore, Olivia.
Rasmussen Alfred Johannes, Houston.
Rosenwald, Walter Frank, Madison.
Stowell, Willard, Northfield.
Tanner, Walter Krabiel, Cannon Falls.
West, Robert William, Rochester.
Wilcox, Ralph DeWitte, Minneapolis.
Williams, Charles Arthur, Cleveland, O.
Wood, Sheldon, Minneapolis.
Woolery, Mark Davis, Blue Earth.

MECHANICAL ENGINEERS, 33.

Alden, Lyman Shedd, Minneapolis.
Bohn, Carl Frederic, Minneapolis.
Brett, Geo. Carpenter, Minneapolis.
Campbell, Lewis Park, Duluth.
Cannon, Fred Kendric, Green Bay, Wis.
Caplin, George Wyndham, Minneapolis.
Carrigan, Chas., Lake Side,
Cutter Francis Charles, St. Paul.
Downs, Gerald Huntley, St. Paul.
Dunn, John William, Minneapolis.
Fuller, Harry Victor, Mankato.
Furber, Angier, Minneapolis.
Grube, Arthur Carl, St. Paul.
Henry, Addis Victor, White Sulphur Springs, Mont.
Hovde, Edward Eugene, Wabasha.
Jackson, Earle Daniel, Minneapolis.
Kinnard, Chester Haines, Minneapolis.
Lebeau, Henry Charles, Little Falls.
Lewis, Edward Bunker, Willmar.
Loye, Benjamin Whipple, Red Wing.
Meldahl, Bernard, Duluth.
Nelson, Arne, Wilmar.
Noyes, Edgar Leonard, Minnetonka Mills.
Otto, Robert Walter, St. Paul.
Pike, Roy Manning, Lake City.
Porten, William Fred, St. Paul.
Pratt, Arthur Pierce, Red Wing.
Prideman, John Garfield, St. Paul.
Sharood, Charles Roy, St. Paul.
Sheldon, Walter Brooks, Minneapolis.
Sperry, Leonard Boyd, Wasioja.
Stephenson, Oliver Harold, St. Paul.
Towle, Merton, Red Wing.

ELECTRICAL ENGINEERS, 32.

Adams, William Charles, Minneapolis.
Bosworth, Vern Howard, Utica.
Bowman, Frank Atherton, Rainy Lake.
Crown, William Clark, Renville.
Cheney, Edward Joseph, Kissauqua, Ia.
Childs, Donald, Ortonville.
Corning, Edward Rae, Hamton, Ia.
Crabbe, George, Minneapolis.
DeLamere, Charles Thomas, St. Paul.
Downing Lloyd, St. Charles.
Fairchild, Albert Royal, Renville.
Ford, Arthur Francis, White Sulphur Springs, Mont.
Goodwin, Victor Earl, Minneapolis.
Halvorson, Henry Theodore, Rushford.
Hooper, Wyllys Gould, St. Paul.
Howatt, James William, Wabasha.
Howatt, John, Lake City.
Johnston, Wayburn Eugene, Estherville, Ia.
Kochendorfer, Milton, South Park.
Lawrence, Herbert Kenneth, Jordan.
Lum, Fred Carleton, Minneapolis.
Malmberg, Clarence Oscar, Austin.
Manthey, George Hollmover, Minneapolis.
Morris, Robert, Greenleafton.
Morton, Harry Garfield, St. Paul.
Otto, Fred Arthur, St. Paul.
Peterson, Henry Philip, James, S. D.
Richards, Cleon Burge, Minneapolis.
Saunders, Arthur William, St. Paul.
Slocum, Roy Caswell, Minneapolis.
Taplin, Robert Baird, Ontario, Can.
Tomlinson, L. C., Glencoe.

FIVE YEAR—Science and Technology.

JUNIOR CLASS, 3.

Frederickson, Matt, Windom.
Wendell, William Fuller, Minneapolis.
Whitney, Alfred C., St. Paul.

UNCLASSED STUDENTS, 24.

Armstrong, Thomas Stanley, St. Paul.
Brown, James Everett, St. Paul.
Carpenter, Cecil Fredus, Minneapolis.
Davis, Charles Asa, Minneapolis.
Fagan, Lewis Edward, Scotch Grove, Ia.
Fahlgren, Nils Leonard, Minneapolis.
Fee, Charles William, St. Paul.
—Foss, Lota Alice, Minneapolis.
Gibbs, Elbert Allan, Zumbrota.
Gunderson, Carl, Minneapolis.
—Hall, Alice H., Minneapolis.
Helms, Frank Charles, Cumberland, Wis.
Kiefer, Phil Jacob, Moorhead.
Lane, Roy Ellsworth, Minneapolis.
Marks, Constant Roberts Jr., Sioux City, Ia.
Mellinger, Guy K., Pine Island.
Michael, William C., Walker.
Moore, Robert Dupont, Roselle, N. J.
Rand, Arthur H., Minneapolis.
Schow, William Peter, Stillwater.
Shepley, Charles R., Minneapolis.
Smith, Randall W., Minneapolis.
Stenger, Lawrence Arthur, Parker, S. D.
Walstad, Adolph Nichols, Minneapolis.

ART COURSE, 16.

—Baxter, Wilma Kathryn, Minneapolis.
—Brown, Edith, Minneapolis.
—Currie, Bessie Bangs, Merriam Park.
—Egbert, Annie S., Minneapolis.
—Esmond, Charlotte, Minneapolis.
—Janney, Ellen Annete, Minneapolis.
Jerome. Charles W., Minneapolis.
—McClelland Alice, Minneapolis.
—Moran, Nellie Agnes, Minneapolis.
—Mowry, Myrtle, Ella, Minneapolis.
—Rothschild, Ella, St. Paul.
—Steward, Maude H., Minneapolis.
—Taylor, Lilly Florence, Red Wing.
—Verharen, Lulu Maude, Spencer, Ia.
—Westfall, Emma, Redwood Falls.
—Wilcox, Myrtia Emily, Minneapolis.

THE SCHOOL OF MINES.

SENIOR CLASS, 8.

Burgess, Thomas Oakes, Minneapolis.
Clapp, W. Howard, Oronaco.
Gholz, Arthur Lawrence, Roscoe.
Johnson, Ralph Ingersoll, Minneapolis.
Sanderson, Henry Stephen, Minneapolis.
Smith, Elmo, Vincent, Minneapolis.
Smith, Hoval A., St. Ausgar, Ia.
Taresh, John, Sauk Center.

JUNIOR CLASS, 15.

Bissell, Angelo Allen, Redwood Falls.
Cory, Milton Burnett, Minneapolis.
Flynn, John Gerald, Lake City.
Hendrickson, James Franklin, Jr., Brooklyn, N. Y.
Holden, Henry Hall, Duluth.
Hoyt, Charles Cameron, St. Paul.
Jones, Robert Clarence, Minneapolis.
Kramer, Harold W., Webster, S. D.
Lovett, Henry Steele, Minneapolis.
Morris, Charles Statham, Duluth.
Overmire, Charles Carson, Eureka.
Smith, Carl James, Cambridge.
Sowle, Lawrence Kimball, Minneapolis.
Truesdell, William Howard, St. Paul.
VanBergen, Robert Evans, Minneapolis.

SOPHOMORE CLASS, 26.

Ambrose, John Robert Wm., Berlin, Wis.
Avery, Charles Dwight, Minneapolis.
Bach, John, Fergus Falls.
Boyd, Robert Russell, St. Charles.
Brosius, Harold Irving, Stillwater.
Callaway, Frederick William, Minneapolis.
Cohen, Samuel William, St. Paul.
Cooper, Harry Freeman, Minneapolis.
Devereaux, John Albert, Minneapolis.
Field, Edward Morse, Jr., New York City,
Freimuth, Louis, Duluth.
Graham, Walter Allen, Minneapolis.
Hoard, Harold Joseph, Red Wing.
Lamberton, Herbert Sears, Lake City.
Lane, Charles Frank, Minneapolis.
Loye, Henry E., Red Wing.
Merricks, Homer, Minneapolis.
O'Marr, Louis J., White Sulphur Springs, Mont.
Rait, Donald M,, Minneapolis.
Schilplin, Walter J., Minneapolis.
Sheldon, Joe T., Northfield.
Smith, Franklin W., St. Paul.
Wagen, Jakie Charles, Mankato.
Whiteley, Eugene E., Brainerd.
Willis, Carl S., Minneapolis.
Winther, Arno, Fergus Falls.

FRESHMAN CLASS, 36.

Angst, Harry Hugo, Minneapolis.
Bass, Samuel Thayer, St. Paul.
Batson, Johu Burnace, Crystal.
Blanding, Edward M., St. Croix Falls, Wis.
Brooks, Allen Marritt, Minneapolis.
Claypool, Charles Holmes, Duluth.
Colhoun, Allen Banatyne, Minneapolis.
Collester, Thorley Marc, Minneapolis.
Corl, Edward Jennings, Minneapolis.
Devereaux, Francis Cyril, Minneapolis.
Donaldson, Alexander Hazseltine, Minneapolis.
Edmonds, Frank Norman, Minneapolis.
Edwards, Norton Henry, Duluth.
Graham, Robert Waldron, Anoka.
Hale, Will Hammond, Minneapolis.
Hoyes, Samuel Evans, Minneapolis.
Houlton, Lewis Kendal, St. Cloud.
Ingalls, Clarence Frank, St. Panl.
Knopp, Arthur Adelbert, Winona.
Kuehn, Amor Frederik, Minneapolis.
Lamphere, Joseph Sherman, St. Paul.
McCammon, Edward Eugene, St. Paul.
McCarty, Adrew Leonard, Good Thunder.

Meier, Robert, New Ulm.
Merritt, Lucien, Duluth.
Mitchell, Robert Colfax, Jr., Duluth.
Nelson, Enoch, Winona.
Nye, Charles Wheeler, St. Paul.
Penfield, Herbert Jefferson, Hudson, Wis.
Richards, Earl, Duluth.
Rohr, Carl von, Winona.
Schrader, Erich Julius, Minneapolis.
Shonts, Sydney Latham, Fergus Falls.
Squyer, Dewey Chas., Minneapolis.
Stoughton, Arthur Guv, St. Paul,
Thompson, Clarence Rudolph, Preston.

UNCLASSED STUDENTS, 1.

Whidden, Ralph Cooper, Westford, Mass.

COLLEGE OF AGRICULTURE.

SENIOR CLASS, 4.

Aune, Beyer, Starbuck.
Bull, Coates P., Edina Mills.
Glover, Arthur J., St. Paul.
Washburn, Robert Mann, Monticello.

JUNIOR CLASS, 5.

Buell, Max Whitney, St. Anthony Park.
Mackintosh, Roger Sherman, Langdon.
Riley, Edward Henry, Hammond.
Thompson, Mortimer Lee, LaCrosse, Wis.
Tasa, Helge Ludwig, Holden.

SOPHOMORE, 4.

Becksted, Jesse Franklin, St. Anthony Park.
Gaumnitz, Daniel Asher, St, Cloud.
Guthrie, Francis Burrell, St. Anthony Park..
Krum, Henry Garfield, Minneapolis.

FRESHMAN CLASS, 14.

Busian, Gerhard Lud, Dover.
Cuzner, Harold, Minneapolis.
Dean, George Edward, Bloomington.
Firmin, Alfred Fouracre, Minneapolis.
Hoagland, Ralph, St. Anthony Park.
Lugger, Humboldt, St. Anthony Park.
McGuire, Arthur James, Hegbert.
—Matthews, Mary Lockwood, Cambridge City, Ind.
Parker, Edward Cary, St. Paul,
Schrader, Udo, Minneapolis.
Thompson, James J., Lanesboro.
Thompson, Porteous Isaac, Houston.
Ward, Fred, Buffalo.
—Wilcox, Estella Willa, Hugo.

SCHOOL OF AGRICULTURE.

GRADUATE STUDENTS, 3.

Anderson, Arthur Henry, Rowland.
Liggett, Alfred Russell, Detroit, Mich.
Pratt, Celia Jane, Bethel.

UNCLASSED STUDENTS, 3.

Hayes, Morris Charles, Minneapolis.
Parker, Edward Carey, St. Anthony Park.
Pendergast, Ellen M., Hutchinson.

A CLASS 63.

Aaker, Olaf N., Kenyon.
Adams, Theodore Nelson, Luverne.
Baker, Albert Tarbjorn, Kenyon.
Biery, Elizabeth Anna, Cheney.
Boerner, Emil G., Buffalo.
Boss, David, Zumbro Falls.
Cutting, Fred Everstine, Byron.
Danielson, George Adolph, Goodhue.
Davis, David, Duluth.
Davison, Charles Bradley, Granada.
Denison, Mary Agnes, Faribault.
Emmans, George Martin, St. Francis.
Evenson, Hans Olaf, Strout.
Evenson, Robert Benjamin, Strout.
Frank, James, Warren.
Frear, Jenness Boughton, Minnetonka Mills.
Giesmann, August Rudolph, Merriam Park.
Giesmann, Elma Alice, Merriam Park.
Goodrich, Perry L., Calhoun, Mo.
Grant, Arthur Dow, Faribault.
Hanson Andrew, Evan.
Holen, Edward Christian, Pelican Rapids.
Hompe, Howard Ernest, Deer Creek.
Howland Jesse, Northfield.
Hunt, William, River Falls, Wis.
Ingalls, Herbert Benjamin, Blooming Prairie.
Jackson, Gilbert, Litchfield.
Keller, Lizzie Anne, Merriam Park.
Kidder, Bryon Ayer, Marshall.
Laate, Gurid, Radcliffe, Ia.
Larson, Albert Gapheus, Bradford.
Larson, Alfred Gottholi, Winthrop.
Leach, Ray, Excelsior.
Leinen, Mary E., Merriam Park.
Lenhart, Edna, Minneapolis.
Lind, Emma, Houston.
Lunde, Henry Carl, Lansing.
MacComber, George E., Duluth.
McLaren, Harley Edward, Buffalo Lake.
Newton, William, Austin, Ark.
Oberg, Edgar Theodore, Watertown.
Palmer, Mabel C., Como, Wis.
Parker, Robert Stewart, Coatopa, Ala.
Peterson. Peter Godfrey. Hector.
Poole, Harvey Wentworth, Winnebago City.
Praught, Donald James, St. Michael's Station.
Robert, Harry Leslie, Cottage Grove.
Roohr, Francis Louis, Warwick.
Sampson, Theodore Joshua, Strout.
Sanderson Theodore, Rock Dell.
Schumacher, Clara, St. Anthony Park.
Scott, Herbert Charles Robert, Thielman.
Seltz, William Frederick, Waconia.
Sheldon, Horace Fuller, Paynesville.
Sheldon, Merton Luther, Paynesville.
Strunk, Blanche Alice, Faribault.
Thompson, Thomas Edward, Christiana.
Washburn, Lura Mabel, Otsego.
Wickstrom, Adolph Fred, Oak Grove.
Wolner, Hans Julius, St. Anthony Park.
Woodward, George Eugene, Langdon.
Worthley, Ralph, Sherburne.
Young, William Ralph, Holloway.

B CLASS 93.

Abrahamson, Elmer Oliver, Houston.
Alsaker, Richard Edwin, Benson.
Anderson. John Edward, Dell Rapids, S. D.
Appel, Frank James, Theilman.
Austvold, Theodore Ben, Glenwood.
Bacheller, Thomas Thaxter, Jr., Minneapolis.
Bassett, Lelia Adel, Rushmore.
Binford, Dora Ethel, Westland, Ind.
Bjertson, Bennie Ludvig, Hanska.
Blair, Donald Scripture, St. Anthony Park.
Boss, John, Zumbro Falls.
Brimmer, Archie Eli, St. Anthony Park.
Brude, Julia, Hanska.
Brudelie, Oluf, Hanska.
Busse, Maud, Merriam Park.
Cederholm, Ida Louisa, Cannon Falls.
Christenson, Bertel Peter, Hutchinson.
Clouse, Frank, Spring Valley.
Collins, Gertrude Valentine, Livingston, Mont.
Cooper, Thomas Poe, Emerado, N. D.
Cosart, George Lawrence, Maine Prairie.
Dailey, Robert, Flandreau, S. D.
Danielson, Howard Raymond, Goodhue.
Davidson, Frank Thomas, Dover.
Edwards, Arthur Farmer, Spring Valley.
Embertson, Oscar Frederick, Grue.
Enestvedt, Engebret German, Belview.
Ericson, Agnes Charlotte, Hector.
Fasken, Eva Irene, Faribualt.
Ferch, Lydia, Odessa.
Ferch, Susie Martha, Odessa.
Fingerson, Gilbert Jorgen, Swift Falls.
Fowler, Robert Grey, Amery, Wis.
Gilbert, Mary Emily, Herman.
Goodhue, Ralph Bigelow, Northfield.
Grant, Charles Francis, Windom.
Grant, George William, Windom.
Hall, Mary Julia, Fairmont.
Halvorson, Ole Levi, Grove City.
Hanson, Loney Mikel, Crookston.
Herbrandson, Herman, Brooten.
Holmberg, John Nathaniel, Renville.

Hosford, John Benjamin, Nashua.
Hummel, Charles Edward, Dundas.
Hummel, Lucy A., St. Paul Park.
Johnshoy, Herman Magnus, Horeb.
King, Ernest Arthur, Chatfieid.
Koch, Mary Elizabeth, Litchfield.
Lowe, Franklin John, Fairmont.
Ludtke, Henry Adolph, Willow Creek.
Miller, Ralph Chafee, Bloomington.
Palmer, Edwin Arthur, Somerset, Wis.
Paterson, Thomas George, St. Cloud.
Payne. Claude Clarke, Kasota.
Pease, Ray Ernest, Hamilton,
Pennington, Grace Lura, Cottage Grove.
Pennington, Alfred George, Cottage Grove.
Perkins, Ross Brankstone, Houston.
Philley, Marie, Louisburg.
Pryce, Arthur William, Beaver Creek.
Randall, Clarence Brewster, Hamline.
Randall, Karl, Camden Place.
Reilly. Alta Eliza, Northfield.
Rittle, William Henry, St. Paul.
Robinson, Edward William, St. Paul.
Rose, John De Cew, Detroit.
Rose, Maud, Detroit.
Rustad, Alvin, Dalton.
Sargent, Edwin William, Red Wing.
Schneider, John Walter, White Bear Lake.
Scott, Roy, Grand Forks, N. D.
Shaver, Fay Robinson, Redwood Falls.
Shumway, Roy Clague, Northfield.
Sletten, Hans Magnus, Willmar.
Spreiter, Walter Emil, Berne.
Staples, Edith Helen, West St. Paul.
Taylor, Glen Royal, Spring Valley.
Thoe, Jacob, Oslo.
Thomas, Charles Henry, Withrow.
Thomson, Wirt Amos, Grand Rapids.
Thorpe, Edward Lawrence, Willmar.
Tomhave, William Henry, Fergus Falls.
Tyler, Lharies Shirley, Minneapolis.
Tyler, Granville Albion, Minneapolis.
Tyson, Robert Edwin, Redwood Falls.
Van Slyke, Letitia Ann, Northfield.
Van Vlissingen, Paul Cornelius, Hitterdal.
Voxland, Clara, Norway.
Warden. Lola Elizabeth, Maine Prairie.
Wells, Mabel Annis, Monticello.
Wilcox, Jean Elizabeth, Hugo.
Wilson, Nettie Ray, Davies.
Wilzbacher, Louise Rose, Merriam Park.

C CLASS, 160.

Aldrich, Stanley Martin, Minneapolis.
Alexander, Fannie Percival, Brownton.
Allen, Milo Bailey, Spring Valley.
Anderson, Chace, Hutchinson.
Anderson, Julius, Bird Island.
Arnold, Charles Frederick, St. Peter.
Bailey, Claude Harold, Minneapolis.
Baker, William Gladstone, Granite Falls.
Barton, Ralph Wallace, Tracy.
Beardsley, William Theyer. Minneapolis.
Betaque, Harry Andrew, Rochester.
Blackburn, James Raymond, Royal, Neb.
Brandvold, Carrie Knute, Dalton.
Brekke, Inger Jensina, Norway.
Bruce, Ellen Mary, St. Anthony Park.
Bryans, William J., Grand Meadow.
Calderwood, Charles Granville, Newport.
Calmer, Ebb Rudolph, Hallock.
Camp, Abner Wilson, Holdingford.
Campion, Jesse William, Angus.
Carlton, Jay Strong, Merton.
Chase, Charles Clement, St. Anthony Park.
Chase, Clement George, Farmington.
Clapp, Wiliam Angus, Roberts, Wis.
Clouston, Joseph, Barnesville.
Cutts, James Abraham Garfield, Forest City.
Dalbotten, Anna Melvina, Nansen.
Dalbotten, Ida, Nansen.
Dalbotten, Oliver, Nansen.
Danelz, Garfield Benjamin, Swift Falls.
Dieter, George Miller, St. Paul.
Dinsmoor, Charles Derwood, Austin.
Dinsmoor, Fay, Austin.
Dixon, Cyril Enkles, Northfield.
Dunaven, Walter Loyley, Cross Lake.
Edwards, Annette, Spring Valley.
Eggena, Mary Helena, Maple Lake.
Elliot, Wyman Smith, Minneapolis.
Ellison, Frank Harold, Minneapolis.
Emerson, Isaac, West Concord.
Ferch, Paul H., Odessa.
Fay, John Albert, Ortonville.
Finnie, David Ormston, Emerado, N. D.
Garvey, Harry Frederick, Minneapolis.
Gaumritz, Amos John, St. Cloud.
Grant, John Geddes, Windom.
Gregor, John, Hutchinson.
Gronwald, William Frederick, Faribault.
Halvorson, Henry Levi, Litchfield
Halvorson, Ida Gurine Henriette, Grove City.
Hanson, Simon Edwin, Two Harbors.
Harper, Roy Slater, St. Paul.
Haugen, Eddie, Pelican Rapids.
Heier, Carrie Sophia, Twin Valley.
Higbie, Clarence Wilson, Grand Meadow.
Holmquist, Clementine Aurora, Providence.
Holt, Edward August, Delhi.
Ingalls, Ruth Evaline, Blooming Prairie.

Jaeger, Emily, St. Paul.
Janney, Douglas M., Minneapolis.
Jehle, Robert Andrew, St. Paul.
Jepson, Frank, Richfield.
Johnson, Bert, Warwick.
Johnson, Charles Lucius, Audubon.
Johnston, Christine Margaret, Robbinsdale.
Johnston. Wallace George, Robbinsdale.
Jones, Harold Winthrop, Minneapolis.
Joyce, Richard W., Hammond, Wis.
Keller, Rose C., Dundas
King, Charlotte Barbara, St. Paul.
Larson, Henry William, Swea City, Ia.
Lee, Russell Waller, Emerado, N. D.
Leet, Martin, Fesston.
Leighton, Harry Milton, Minneapolis.
Lein, Bernard, Carlisle.
Lenz, Emma, Minneapolis.
Leonard, Frank, Balmoral.
Liggett, Walter William, St. Anthony Park.
Lingen, Carl Johan, Starbuck.
Lockwood, Henry Jay, Grand Meadow.
McConnell, Roy Elmer, St. Cloud.
MacKean, Augustus Smith, Fishing Creek, N. J.
McLeod, Leon Thomas. St. Michaels Sta.
Mendell, George Dwight, Faribault.
Maring, Albert, Hanson.
Marteus, Jens, Aberdeen, S. D.
Meilicke, Otto Frederick, Windom.
Melom, Matthew Halverson, Dawson.
Mills, Frederick Leander, Minneapolis.
Mills, Garfield Russell, London.
Murphy, Harley Fred, Hamline.
Nane, Elsie Louise, Rockford.
Nelson, Christian G., Lanesboro.
Nordstrom, Hilda Winifred, St. Paul.
O'Connell, Richard C., River Falls, Wis.
Olson, Carl, Brandon.
Olson, Ella Mathalia, Belview.
Olson, John Morris, Welch.
Pearson, Matilda, Louisburg.
Peck, William Argalus, Minneapolis.
Pemberton, Ada Maude, Washburn P. O.
Pennington, Frank James, Cottage Grove.
Pentz, Walter Franklin, Faribault.
Perkins, Roy B., Windom.
Perry, James Raymond, Red Wing.
Peters, Cora Frances, St. Paul.
Peterson, Arthur Willard, Litchfield.
Peterson, Clarence Edward, Brighton.
Peterson, Eric Ludwig, Dawson.
Peterson, Minnie Cordelia, Brighton.
Peterson, Regina, Hector.
Peterson, Segwal Sophus, Minneapolis.
Pierce, Mabel Alice, St. Anthony Park.
Prosser, William Glen, Le Roy.
Ramstad, Samuel Edward, West Lake.
Reinert, Charles, Odin.
Rice, Gertrude Alice, Monticello.
Rietz, Oliver Augustus, Victoria.
Ritzinger, Frederick, St. Paul.
Reach, Samuel Zimmerman, Paynesville.
Rollefson, Carl Jacob, Clarkfield.
Roth. Gilbert Eugene, Danvers.
Russ, Ethel Olive, Crystal Lake.
Ruud, Carl Oscar, Dawson.
Schmitz, Prosper Lorenz, Stewart.
Schrepel, Geo. William, LeSueur.
Schwartz, Oscar August, Sargeant.
Sheldon, Lester Harte, Paynesville.
Shelley, Edward Liver, Hanska.
Shuman, Nellie Corinne, Excelsior.
Smith, DeWitt Bristol, Mission Hill, S. D.
Smith, Langford Wheaton, St. Paul.
Smith, Phoebe Carrington, St. Paul.
Spencer, Nellie Sophia, St. Paul.
Storle, Peter Oscar, Lanesboro.
Sullivan. Albert Henry, Adrian.
Swenson, Gilbert, Hoyt.
Swenson, Halvor, Lamberton.
Thayer, Rowland, Minneapolis.
Thoe, Oscar, Oslo.
Thompson, George Edward, Barnesville.
Thompson, Mortimer Lee, La Crosse, Wis.
Thoreson, Hannah, Neby.
Turner, Albert Gordon, Henrytown.
Valentine, Edwin Myers, St. Paul,
Wasson, Harris Berton, Belview.
Waters, Guy Franklin, Forest Lake.
Watson, Frank Merton, River Falls. Wis.
White, Hall, Winnebago City.
Whitney, Carl, Minneapolis.
Whitney, June Dexter, Minneapolis.
Wilcox, Alfred Gould, Hugo.
Wilcox, Richard Selden, Hugo.
Wilcox, William Woods, Hugo.
Wilkins, Annie Loretta, Minneapolis.
Winslow, Sears Hosmer, Fountain.
Wold, Christian Willickson, Averill.
Wollan, Anton Marcus, Starbuck.
Worthington, Bernice Mary, River Falls, Wis.
Wulf, Emma Augusta, Wheaton.

PREPARATORY CLASS, 68.

Aakre, Anna. Oslo,
Anderson, Iver, Lanesboro.
Bauman, Felix Henry, Minneapolis.
Benchley, Mary Louise, Minneapolis.
Broin, Oscar, Kenyon.
Bryans, Edward, Grand Meadow.

Camp, Elverna, Holdingford.
Edstrom, Algot Martin, Wastedo.
Eide, Peter J., Eldred.
Epler, Joseph, Balmoral.
Erickson, Odin Theodore, Grove City.
Fean, Edward W., Plainview.
Field, Earl, Zumbro Falls.
Forsberg, Albert Theodor, Lamson.
Geary, Anonette Mary, Minneapolis.
Gilbertson, Martin Gerhard, Lanesboro.
Graves, Blanche, St. Anthony Park.
Gullings, Knute,
Haagenson, Emily, Carlisle.
Hanratty, Patrick Andrew, Barry.
Harrison, Clement Allen, Bloomington.
Hatling, Lewis A., Dalton.
Hegseth, Peter, Carlisle.
Hoverstad, Christopher Martinus, Holden.
Howes, Erwin Arthur, Belview.
Hursh, Frederick Cyrus, Henning.
Jacobsen, Frank, Lynd.
Johnson, Ophelia, Acton.
Johnson, William August, Olivia.
Jonson, Axel Ernest, Triumph.
Kassube, Frederick William, Hamel.
Kaufman, Susanna, Arlington.
Kelly, Thomas Frank, Hegbert.
Lee, Oscar Sylvanus, Madison.
Ley. Peter James, Smithfield.
Linn, Fred, Lake Lillian.
Lonne, George Reynold, Eldrid.
Losleben, George, Sleepy Eye.
Loudon, Chester, Maine Prairie.
McLane, Daniel Leonard, Brown Valley
Marple, Ernest Everett, Wendell.
Masterman, Chester Albin, Stillwater.
Matthews, Meredith, Cambridge City, Ind.
Mitchell, Bessie, New York Mills.
Mueller, Paul Reinhart, Fairfield.
Munkel, Otto, Eitzen.
Nickels, August Frederick, Austin.
Newcomb, Earl Bradford, Minneapolis.
Orsen, Nickolai, Minneota.
Orton, George Edward, Marietta.
Ouren, Alfred B., Hanska.
Palmer, Harry.
Pengra, Fred Burnham, Luverne.
Peterson, Clarence Edward, Olivia.
Peterson, Carl Hjalmer, Lynd.
Peterson, Paul, Georgeville.
Randall, Rufus Russell, Warsaw.
Robertson, Lynn Shelby, London.
Roehrs, William, Ceylon.
Schilling, Jacob, Smithfield.
Steenerson, Arne Orlando, Climax.
Stimson, Herbert Evelyn, Minneapolis.
Stoa, Mary, Joyce.
Strand, Alfred, Kensington.
Streetly, Charles, St. Francis.
Suter, Chester, Welcome.
Webster, Alfred Alexis, Bernadotte.
Wilder, Davis Eybon, Brownsdale.

SPECIAL CLASS, 28.

Anderson, Earnest F., Carver.
Arness, Ole C., Eldred.
Bisbee, Maurice, Watonwan.
Blackman, C. E. Northfield.
Braaten, Ole O., Brooten.
Cairns, P. J., Minneapolis.
Carberry, Tom, Edgerton.
Clark, Will, Cadott.
Eid, Ole J., Sundahl.
Eliason, Simon G., Montevideo.
Fay, John A., Edgerton.
Glesne, Curnall, Sunburgh.
Hayden. James H., St. Paul.
Lasher, Harry H., Montevideo.
Ludwig, Edward., Cottonwood.
Myaer, O. L., St. Paul.
Nelson, Edward J., Canby.
Nelson, Einar E., Fort Ridgley.
Nordby, Carl H., Renville.
Norgaarden, Lars, Ostrander.
Olsen, Elmer A., Newport.
Olson, Nils E., Belview.
Sheldon, L. J., Paynesville.
Svor, Ole R., Swift.
Swenson, Charles J., Amor.
Swenson, O., Otisco.
Tollefsrud, Peter, Sunburgh.
Wilding, Wm. H,

DAIRY SCHOOL, JANUARY 1901 99.

Ahlm, Carl E., East Union.
Anderson, Walter, Washburn.
Antony, John P., St. Leo.
Arneson, Oluf, Spring Valley.
Barberree, Albert A., St. Anthony Park.
Bliss, J. A., Rochester.
Blomquist, Emil, Almelund.
Bollemose, Harold, Snohomish, Wash.
Braun, L. B., Kellogg.
Bursch, B. G , Panola.
Crow, Wm., Osseo, Wis.
Doepping, Wm., Claremont.
Dorn, Hugo, Fairfax.
Dressel, Alfred, Le Sueur.
Duncan, O. R., Medford.
Effertz, Gottleib, Norwood.

Ericsson, Elow, Minneapolis.
Felton, Gary N., Owatonna.
Fenske, Albert E., New Rome.
Fitzpatrick, J. W., Green Isle.
Gardner, Archie, Ceylon.
Goplen, Albert, Roscoe.
Grant, J. W., Wolcott.
Grathwol, Alex, New Ulm.
Grellong, Louis J., Lester Prairie.
Grussendorf, Edward, Klossner.
Hager, Ben, Dumfries.
Hansen, Andrew, Stewart.
Hansen, H. P., Evan.
Henkelman, Leo. H., Janesville.
Hodson, L. H., Minneapolis.
Hoefer, Wm., Alexandria.
Hoeschen, M. J., Freeport.
Holt, Otto, Chisago City.
Howe, John G., Kellogg.
Hursh, Frederick C., Henning.
Iverson, I. G , Watson.
Iverson, N. P., Ogden, Iowa.
Johnson, Carl J., Minneapolis.
Johnson, Ole, Dundee.
Johnson, Willie, Carver.
Just, Edward, Rapidan.
Kilen, Edward, Jackson.
Knapp, A. S., Beauford.
Knudson, Gust, Manchester.
Kolell, August, Dodge Center.
McCarthy, J. T., West Concord.
McGregor, Myron, Austin.
McMicking. W. W , New Paynesville.
Mansen, Charles, Paddock.
Michael, Casper, Freeport.
Moldenhauer, Leo, Chaska.
Morken. Ole, Wilmington.
Morse, Roy L., Rochester.
Nelson, George, New Sweden.
Nelson, Ruben L., Waverly Mills.
Niebuhr, G. C., Mansfield.
Nyberg, J. E., Darwin.
Olson, Helmer, Grove City.
Olson, P. H., Jackson.
Pagel, John, Sogn.
Paulson, G. A., Godahl.
Person, C. J., Wegdahl.
Peterson, Edward H., Oxlip.
Pflepson, Peter P., Cold Spring.
Pomroy, James T., Lake Benton.
Porter, J. H., Moscow.
Prentice, Fred, Cogswell, N. D.
Pundsack, F. A., New Munich.
Quist, Fred, St. Francis.
Rarick, Fred S., Garden City, S. D.
Rasmussen, Wm. H., Steel Center.
Rowland, W. J., Kilkenny.
Ryan, Andy, Arlington.
Sanderlin, J. A., Owatonna.
Schandel, A. G., Rapidan.
Schultz, Alfred, Bricolyn.
Scripture, F. R., West Concord.
Sersland, Halvor, Gary.
Shore, John W., Lac qui Parle.
Siebold, Fred, Hutchinson.
Simpson. James, Lowry.
Slater, H. N., Wilbert.
Sohlberg, John, Blue Earth.
Stevens, Wilbur, Rush City.
Sunde, A. T., Godahl.
Sunde, O. T., Godahl.
Swenson, August, Bernadotte.
Topp, Christian, Lydia.
Wanderoos, I. K., Minneapolis.
Ward, R. M., Clear Lake.
Westick, O., Minneapolis.
Whitmore, Milton, Montevideo.
Wohlford, A. K., Clements.
Wohlford, Seth, Morgan.
Wohlhuter, George, Fairmont.
Woodruff, Charles J., St. Francis.
Yerxa, H. C., St. Paul.
Zimmerman, Chas., Owatonna.

THE COLLEGE OF LAW.

FOR DOCTOR OF CIVIL LAW—II.

Bates, William Earl, *LL. M.*, Minneapolis.
Carroll, Walter N., *LL. M.*, Minneapolis.
Coombs, Lee A., *LL. M.*, Minneapolis.
Denegre, James D,. *LL. M.*, St. Paul.
Dever, Charles S., *LL. M.*, Minneapolis.
Herman, Arthur L,, *LL. M.*, Minneapolis.
Mercer, Hugh Victor, *LL. M.*, Minneapolis.
Moore, Albert R., *LL. M.*, St. Paul.
Olson, Carl O. A., *B. S.. LL. M.*, Minneapolis.
Sweet, John C., *LL. M.*, Minneapolis.
Whitcomb, Walter B., *LL. M.*, Minneapolis.

FOR MASTER OF LAWS—II.

Bond, Marie Palmer, *LL. B.*, Minneapolis.
Henningsen, Christian, *LL. B.*, Stillwater.
Hill, R. D., *LL. B.*, Odessa.
Lind, Klas Erland, *LL. B.*, Winthrop.
Mayo, Walter Lewis, *LL. B.*, Leavenworth, Kas.
Olson, Julius John. *LL. B.*, Lake Park.
Robinson, Bertram Henry, *LL. B.*, Minneapolis.
Stewart, McCants, *LL. B.*, Minneapolis.
Todd, Kay, *LL. B.*, Shelton, Wash.
Vasaly, Louis W., *LL. B.*, Little Falls.
Wickersham, Price, *LL. B.*, St. Paul.

SENIOR (DAY SECTION)—76.

Anderson, Andy Norman, Cumberland, Wis.
Bates, Charles Roswell, Little Rock, Ark.
Bessessen, Henry John, (B. A.,) Albert Lea.
Boyer, Carl Adams, St, Paul,
Brace, Clayton Eugene, Mabel.
Bradford, Benjamin H., Milbank, S. D.
Breen, Maurice J., Ghent.
Burglehaus, Theron Woolson, Minneapolis.
Caldwell, Guy Lowell, (B. A.)
Callahan, James A., Minneapolis.
Cameron, Donald Alexander, (B, S.,) La Crosse, Wis.
Campbell, Fred C., St. Charles.
Cooper, Paul Curtis, Jackson.
Crawford, William N. M., Minneapolis.
Detwiler, Jacob S., Charles City, Ia.
Dodge, Clayton J., (B. A) Claremont.
Ellis, Lawrence O., Hixton, Wis.
Ellsworth, Franklin Fowler.
Flannery, Charles S., Minneapolis.
Geraghty, Thomas P., St. Paul,
Gergen, John Bernard, Hastings.
Gipson, Eugene Henry, Faribault.
Gray, Archibald D., Preston.
Gray, Claud Fillmore, Minneapolis.
Griffith, Bertram B., Sleepy Eye.
Grove, Julius O., Glenwood.
Haas, Alfred, Holstein, Ia.
Harker, Bert, Linden, Wis.
Henry, Gilbert, St. Paul.
Holdahl, Ole T., Roseau.
Hookway, Chancellor W., St. Thomas, N. D
Hubachek, Louis A , Racine, Wis.
Iverson, Severin, Minneapolis.
Kaldor, Theodore, Hillsboro, N. D.
Korsvick, Guttorm, Hansen, Galchutt, N. D
Kvello, Alfred Marius, Lisbon, N. D.
Lawrence, William Hamilton, Wabasha,
Lindquist, Ernest, Minneapolis.
Markham, Claron Arthur, Independence, Wis.
Markham, John Albert, Independence, Wis.
Miller, William Hal, Jackson.
More, Russell Andrew, Winona.
Murtha, Thomas Francis, Hersey, Wis.
Nelson, Iver Cornelius, Grand Forks, N. D,
Noyes, Eugene Clement, Minneapolis.
Odell, Clinton M., Minneapolis.
O'Keefe, Daniel J., River Falls, Wis.
Ormond, James Butler, (B. L.,) Hegbert.
Pederson, Sivert, Appleton.
Pitkin, Charles Alfred, Crookston.
Plymat, Walter Ashton, (B. S.,) Mankato.
Reimestad, George Ingvald, Minneapolis,
Richards, Charles Wesley, Stewart.
Richardson, Harold James, Rochester.
Rindahl, John, Holum.
Rossberg, Wm. J., St. Paul.
Schellbach, Charles Henry, Mankato.
Schnorenberg, John Henry, Hartford, Wis.
Scott, Samuel Cyrus, Sandstone.
Severance, William, Beldenville, Wis.
Sheran, John Francis, Alma City.
Spicer, Marion Clifford, Minneapolis.
Stenhaug, John, (B. A.,) Dennison.
Stewart, Robert Carlisle, Santa Barbara, Cal.
Teisberg, Carl Alfred, St. Paul.
Thompson, Paul Jennings, Rosendale, Wis.
Thompson, William Thomas, St. Croix Falls, Wis.
Tiffany, Fred L., Mason City, Ia.
Todd, Jay, Shelton, Wis.
Tone, Aad Addison, (B. S.,) Minneapolis.
Tweet, Henry Christopher, Tracy.
Wachuta, Charles Frank, Minneapolis.
Walso, John, Fergus Falls.
Warren, Charles Parker, Iroquois, S. D.
Willis, Hugh E., (M. A.,) Yankton, S. D.
Woodard, Orlando F., Marshall.
Woods, Roy Charles, Minneapolis.

SENIOR (NIGHT SECTION)—43.

Bannon, Festus Lucian, Iona.
Bearman, Abraham N,, Minneapolis.
Bergheim, Nels N., Minneapolis.
Biron, Robert H.. Battle Creek, Mich.
Blomberg, Chas. August Louis, (B. A.,) St. Peter.
Bowler, Frank Leslie, Bird Island.
Bronson, H, A., (M. A,,) St. Paul.
Chase, Walter S., St. Anthony Park.
Christofferson, Arthur, Hudson, Wis.
Cotton, Claud George, St. Paul.
Downs, John Martin, Willmar.
Enerson, Albert Hovsve, St. Paul.
Goddard, William Taylor, Utica, N. Y.
Grattan, Peter Joseph, Waverly.
Green, James H., Minneapolis.
Hagaman, Harry Arthur, St, Paul.
Harris, James D,, St. Paul.
Heino, John Rudolph, St. Paul.
Jarman, Thomas Jones, Minneapolis.
—Hern, Angie King, St. Paul.
Hollihan, Daniel James, Stillwater.
Johnston, Charles Edward, Minneapolis.
Judson, Harry Carlton, St. Paul.
Levy, Sam Julian. Minneapolis.
Lundborg, Hugo, Minneapolis.
McNamara, Thomas P., St. Paul.
Martin, George Riley, Minneapolis.

Mattimore, James, St. Paul.
Metcalf, John B., Louisville, Ky.
—Morgan, Jessie Thayer, Minneapolis.
Morrison, John A., Minneapolis.
Ogren, John William, Minneapolis.
Olson, Berndt, St. Paul.
Pfaender, Albert, New Ulm.
Rea, James E., St Paul.
Schmidt, Carl Bernhard, Minneapolis
Schonarth, Peter, St. Paul.
Sennett, Lincoln Henry, Maple Lake.
—Smith, Helen, Aurora, Ia.
Soares, Victor E., Minneapolis.
Strom, Carl Sigvert, Lake Crystal.
Torrance, Graham M., St. Paul.
Wittmaack, John Henry, St. Paul.

MIDDLE (DAY SECTION)—107.

Alcott, Robert K., Minneapolis.
Aygarn, Oliver, Choice.
Baker, Frank Milton, Emmetsburg, Ia.
Bane, William Whittemore, Brainerd.
Bengtson, Hans Peter, Canby.
Berge, Herbert James, Jackson.
Berglund, John Julian, Alexandria.
Beum, John Edward, (B. A.,) Soland.
Bonhus, Andrew G., (B. A.,) Aspelund.
Brown, William Scantleberry, Duluth.
Buck, Charle Sumner, Jamestown, N. D.
Burnes, Thomas Francis, Watertown.
Christensen, Albert Henry, Elbow Lake.
Compton, William Gould, Minnehaha Falls
Conry, Joseph J., Ala Vista, Ia.
Conser, Louis Agassiz, Hayfield.
Davis, John Isaac, Marshall.
Dean, Albert Stewart, Monticello.
Dignan, Thomas, Minneapolis.
Dobie, Gilmore, Hastings.
Dyar, Louis Agassiz, Winona

Fitch, Lester John, (B. S.,) Minneapolis.
Flagler, Nicholas, Wimbledon, N. D.
Fraser, Robert Laird, Rochester.
Furst, William, (B. S.,) Minneapolis.
Gallagher, George A., Brainerd.
Gallagher, Michael William, St. Paul.
Gilmore, George Albro, Valley City, N. D.
Gislason, Haldor B., (B. A.,) Minneota.
Gleeson, Joseph William, Minneapolis.
Gleeson, Marttn Henry, Minneapolis.
Halvorson, Henry Olens, Dawson.
Hamley, George Orlando, Minneapolis.
Hammett, William George, Hawley.
Harris, Charles Pearl, West Liberty, Ohio.
Heffron, Frederic Cleveland, Minneapolis.
Henderson, O. J., (B. S.,) Story City, Ia.
Houston, Charles Egbert, River Falls, Wis.
Hurley, Michael Bernard, Pine City.
Jensen, Constan, St. Paul.
Johnson, Henry Ernest, Tintah.
Johnson, J. N., Madison.

Elliott, Ira Russell, Drayton, N. D,
Ellwood, Walter Jesse, Montgomery.
Elmquist, J. Lawrence, St. Paul.
Elwin, Elmer Harrison, Moorhead,
Ermatinger, Joseph Jacob, St. Paul.
Evans, George W., Minneapolis.
Evans, Maurice V., Mankato.
Fagan, Walter Earle, Minneapolis.
Finley, John Matthew, Minneapolis.
Finstuen, Andrew, Zumbrota.
Luby, M. J., (B. S.,) Minneapolis.
McBride, Morton Lewis, Milbank, S. D.
McElmeel, Owen Peter, Delhi, Ia.
McGregor, Bruce Elmo, (B. A,,) Mapleton.
McIntyre, James, (B. S.,) Mannannah.
McKenney, Richard I., No. St. Paul.
McKusic, Fred Pike, Pine City.
MacLane, John Fisher, New Haven, Conn.
McLaughlin, George Vincent, Mapleton.
McNulty, Frank, Sisseton, S. D.
McPartlin, Francis Joseph, Glencoe.
Marshall, W. Frank, Pipestone.
Mitton, William Bayfield, Brown's Valley.
Moore, Murray Marvin, Slayton.
Mueller, Albert W., New Ulm.
Nelson, Bertie, Hutchinson.
Nelson, Cornelius S., Hendrum.
Ness, Sjur Peter, Kenyon.
Newman, Frank Julian, Bemidji.
Nickerson, John E.. Garden City.
Nostdal, Louis Robert, Madelia.
Ofsthun, Christopher O., Cyrus.
Packer, Benjamin Graham, Eau Clair, Wis.
Jordan, Edward, Flandreau S. D,
Kane, James Henry, New Richmond, Wis.
Kingston, Howard William, St. Paul.
Klancke, Emil John Charles, Norwood.
Kleinmann, Charles P.. Hutchinson.
Lamson, William Howard, Winona.
Lawrence, Percy Jones, Minneapolis.
Laycock, Ernest, (B. A.,) New Bedford, Mass.
Livermore, Harry Adam, Fairmont.
Lovett, Ralph Edwin, B. S., Minneapolis.
Paulsohn, Gustaf, Minneapolis.
Phillips James E., (B. A.,) Arlington.
Quamme, Edward Guthorm, Kenyon.
Rachie, Elias, (M. A.,) Granite Falls.
Radcliffe, S. J,. Larimore, N. D.
Richardson, Elmer, (Ph. B.,) Drayton, N. D.
Rickert, Jacob Arthur, Wapeton, N. D.
Rosholt, Jacob, McIntosh.

Rosholt, Jacob, McIntosh.
Scott, S. F., Hallock.
Simpson, Earl, (B. A.,) Winona.
Sobotka, Ottocar, St. Paul.
Solem, Louis, Minneapolis.
Stanford, Ralph Waldo, Kandiyohi.
Stearns, George, Minneapolis.
Stevens, Robert Walter, Minneapolis.
Stolberg, Alfred Peter, (B. A.,) Harris.
Swenumson, S., Saude, Ia.
Terry, Robert Weston, Slayton.
Thornton, John James, St. James.
Webb, George Taylor, Minneapolis.
Wiegand, George Herman
White Bear Lake.

MIDDLE (NIGHT SECTION)—43.

Andrews, Alva Austin, Minneapolis.
Baldwin, William, Minneapolis.
Bessesen, Nelson Daniel, Albert Lea.
Coleman, Daniel J., Preston.
DesLauriers, Alphonse Joseph, Minneapolis.
Dodge, Vernon Waterman, St. Paul.
Donahue, William H., Minneapolis.
Folds, William Laurence, Minneapolis.
Gleason, James B., Minneapolis.
Guesmer, Arnold Louis, Minneapolis.
Hackney, Joseph Malcome.
Hale, Harry, Minneapolis.
Hamaker, Harry, St. Paul.
Harmon, John Oregon, Jr., (LL. B.,) St. Paul.
Hauck, Edward William, Le Sueur.
Haug, Lars O., Minneapolis.
Heitmann, Johan, Minneapolis.
Hobbs, Waldo Warren, Minneapolis.
Ingerman, Martin Nels, Howard, S. D.
Lains, Harold G., St. Paul.
Lavelle, John Paul, Minneapolis.
Lossow, Albert Henry, (B. S.,) St. Clair.
McGray, Frank Edward, Alexandria.
McKusick, Roy W., Minneapolis.
Maron, Frank Anthony, St. Paul.
Melville, James Condit, Brooklyn, N. Y.
Nash, Louis, St. Paul.
Norton, Eric, St. Paul.
Olson. Charles Leonard, St. Paul.
Poirier, Otto Arthur, Minneapolis.
Potter, Paul Emery, Minneapolis.
Pratt, L. K., St. Paul.
Redding, Paul Secor, Windom.
Ross, John Joseph, Minneapolis.
Schall. Anthony X. J., Minneapolis.
Sexton, Luke K., Chaska.
Silloway, Charles Frank, Minneapolis.
Sperry, Roy E., Wilmar.
Squires, LeRoy Victor, St. Paul.
Tautges, William Amhurst, Minneapolis.
Velikanje, Milan, Minneapolis.
Von Kuster, Paul E, Minneapolis.
Whitney, Arthur Byron, B. S., Slayton.

JUNIOR (DAY SECTION)—106.

Arnold, Horace Franklin, Larimore, N. D.
Austin, Joseph Earl, Minneapolis.
Baldwin, Mathias, Sherman, S. D.
Bartlett, Stanley Pitt, Eau Claire, Wis.
Berg, Alvin Martin, Sleepy Eye.
Berry, Harry Lynn, Mapleton.
Bothne, Nils Johnson, Abercrombie, N. D.
Burchard, Simeon James, Marshall.
Burger, Jeremiah A., Huron, S. D.
Buttz, Adrian, Buttzville, N. D.

Bowler, Madison Caleff, Bird Island.
Breslauer, William Joseph, Minneapolis.
Brooks, Paul Andros, Minneapolis.
Brown, John Harrison, Benson.
Brown, J. M. G., Virginia.
Brown, Warrington, Pipestone.
Browning, Wayne Ferris, Minneapolis.
Chapman, Francis Johnson,
New Richmond, Wis.
Chase, Kelsey Stillman, Faribault.
Chestnut, Alexander R., Minneapolis.
Chrysler, Karl Girard, Lake Park, Ia.
Colmenson, Benjamin, St. Paul.
Connolly, George Joseph, Minneapolis.
Dillman, Raymond Lee, Reville, S. D.
Dyer, George Elmore, B. S., Houston.
Evanson, Edward Antonia, Madelia.
Fernholz, Edward John, Springfield.
Finstad, Ole J., Windom.
Freeman, Edward, Mankato.
*Fuller, Harry Leonard, Pierre, S. D.
Furber, Fred Nason, Detroit.
Gardner, Richard Nelson, Fergus Falls.
Gluck, Albert, Minneapolis.
Gorman, Francis Thomas, White Rock.
Gould, W. Watson, Fairmont.
Graham, Joseph William, Rochester.
Gray, Alton Eugene, Preston.
Griffith, Charles Talmage, Minneapolis.
Gunderson, Andrew Bennett, (B. A.,)
Vermillion, S. D.
Halsted, Hugh Martin, St. Anthony Park.
Halvorson, Halvor L, Henning.
Hanson, George Elmer, Sleepy Eye.
Hanson, Nels Benjamin,
New Centerville, Wis.
Hanson, H, Stanley, Minneapolis.

*Deceased.

Hegland, Martin Johan, (B. A.) Roland, Ia.
Hertz, Abe, St. Paul.
Himsl, Joseph Benedict, St. Cloud.
Holmberg, George Clarence, Minneapolis.
— Hougen. Alinda May, Northwood, N. D.
Hudson, Guy H., Thorp, Wis.
Ingebrektson, Ivar, Minneapolis.
Johnson, Andrew P., Crookston.
Johnson, Leander Reuben, Lysne.
Johnson, Thore Rudolph, Cannon Falls.
Kelley, George Vincent, Fond du Lac, Wis.
Kennicott, Jay H., Luverne.
Knauf, Arthur Lawrence, Jamestown, N. D.
Larson, Henry Albert, Preston.
Lawson, John La Turgey, Owatonna.
—McCardy, Ella Hopson, St. Paul.
McClearn, Hugh James, Minneapolis.
McCollom, William Henry, Minneapolis.
Marshall, Allan K., Westfield, Mass.
Mastenbrook, Adrian D., Kasson.
Maurin, Francis Joseph, Elizabeth.
Michelet, Wilhelm, Minneapolis.
Morrow, Thomas David, Tenney.
Muir, James Andrew, St. Paul.
Murphy, Joseph L., Alma City.
Nieteit, Sun America, Marble Rock, Ia.
Nyborg, M. J. C., Minneapolis.
Q'Donnell, Michael Charles, Avvia.
O'Marr, Louis John, White Sulphur Springs, Mont.
Paddock, George A., Minneapolis.
Page, Leroy Albert, (B. L.) Mason City, Ia.
Paulson, Clarence Alfred, Mayville, N. D.
Reid, Niles Edgerton, St. Paul.
Ronken, Oscar Christian, Ostrander.
Scholle, Gustave, St. Paul.
Schulz, Otto William, Montevideo.
Scoblic, Frank Martin, Olivia.
Scofield, Roy Verne, Minneapolis.
Scribner, James Clinton, Eldorado, Wis.
Shea, George Francis, Perham.
Shea, William Henry, Jr., Sparta, Wis.
Shell, L. M., Anoka.
Simmons, Elbert Osman, Zumbrota.
Simons, T., St. Paul
Smith, Justin M., Brainerd.
Smith, Leo Harry, Hope, N. D.
Smith, Orvill W., Morton.
Smythe, Dan P., Arlington, Oregon.
Solem, Ludwig Oliver, Minneapolis.
Sterling, Charles Parker, Elysian.
Thomason, Hilfred L., Morris.
Thompson, Roy, Minneapolis.
Thompson, William E., Hastings.
Torrence, Lester Wayland, Minneapolis.
Upson, John Eugene, Bryn Mawr.
Vincent, Harry William, Minneapolis.
Wayne, James, Minneapolis.
Wederath, Frank Charles, Morton.
Whitford, George Langdon, St. Paul.
Williams, Edwin Adams, Rochester.
Williams, James Perry, Hayward, Wis.
Young, Bruce Charles, Foley.

JUNIOR (NIGHT SECTION)—66.

Albee, William Edson, Minneapolis.
Allen, Edwin G., Duluth.
Ashbaugh, Edwin, St. Paul.
Bernhagen, John Fred, Minneapolis.
Bishop, Edwin Judson, (B. S.) St. Paul.
Buell, Charles Joseph, North Hudson, Wis.
Burr, Walter Delano, St. Paul.
Cargill, Robert G., Minneapolis.
Cook, Bertram Alcott, Windom.
Cook, Leslie Lloyd, Appleton, Wis.
Crouley, William Dudley, Redwood Falls.
Currie, John D., Minneapolis.
Davis, Louis David, Elgin.
Erickson, Theodore O., Flandreau, S. D.
Farmer, August N., (B. A.,) Spring Valley.
Ferry, Thomas Patrick, DeGraff.
Fosseen, Arthur B., Minneapolis.
Giss, Richard L., Minneapolis.
—Goldsbury, Maud, Cherokee, Ia.
Grass, Charles F., Fergus Falls.
Hanson, Hans Andrew, Faribault.
Harkness, Edgar G., Minneapolis.
Headley, Lucius Ambrose, Luverne.
Hubbard, Walter R., Minneapolis.
Huebener, George Christian, Eau Claire, Wis.
Huntington, Arthur E., (B. S.,) Luverne.
Ingalls, Clarence Frank, St. Paul.
Jargo, J. Elwin, Merriam Park.
Jensen, Nils Martin, Minneapolis.
Jolly, William Franklin, DeSmett, S. D.
Keohane, John Jeremiah, Minneapolis.
Kimball, Claude, Minneapolis.
Kirk, Aubrey Alfred, LeSueur.
Lende, Olai A., Cottonwood.
Liberma, Marco F., Minneapolis.
Loberg, Olaf Lauritz, Minneapolis.
Lundquist, Charles Oscar, Minneapolis.
McKenna, George Michael, St. Paul.
McKusick, Clinton Levi, Pine City.
McNaughton, Archie T., Minneapolis.
Manuel, Ralph William, Minneapolis.
Meilicke, Hugo Emil, Fulda.
Melom, Carl Marcus, Dawson.
Nash, Edward Michael, Minneapolis.
Nash, John P., Minneapolis.
Nash, William M., Minneapolis.

Olsgard, Helmer Osaias, Lakota, N. D.
Peter, Henry, Dolliner, Ia.
Porter, Gardner H., Minneapolis.
Riebeth, George Henry, Minneapolis.
Robertson, Raymond, Minneapolis.
Rostad, J. Edward, Hader.
Russell, Bert, St. Paul.
Schacht, Theodore Albert Elgin.
Schroeder, Peter Francis, Detroit.
Smith, John Philip, Cottonwood.
—Smith, Mary Donovan, St. Paul.
Soule, V. Ormsby, Minneapolis.
Stephanus Charles Joseph S., Minneapolis.
Taylor, Arthur Robert, St. Paul.
Van Pragg, William, Merriam Park.
Van Valkenburg, Harry Jay, Canby.
Verge, Walter Lavender, Minneapolis.
Wennerdahl, John August, Minneapolis.
Willford, Eugene, Minneapolis.
Yeaton, Harrison Train, Cambridge, Mass.

COLLEGE OF MEDICINE AND SURGERY.

GRADUATE STUDENTS, 7.

G. W. Boot, *M. D.*
C. D. Buck, *M. D.*
C. Carlan, *M. D.*
James P. Davis, *M. D.*
George Eitel, *M. D.*
W. E. Rocheford, *M. D.*
F. C. Todd, *M. D.*

FOURTH YEAR, 66.

Adams, Bertram Sage, *B. S.*, '98, Lisbon. N. D.
Argue, George William, Breckenridge.
Armstrong, John Milton, Minneapolis.
Aurand, William Henry, Bowdle, S.D.
Baldwin, William Prendergast, Mich. City, N. D.
Beckman, Emil Hessel, Minneapolis.
Benedict, Erle Edson, Minneapolis.
Blackman, Ernest Linwood, Alden.
Black, James Minneapolis.
Campbell, John Elisha, *M.S.*, Minneapolis
Carman, James Edwin, Minneapolis.
Cassel, Rufus Joshua, Dassel.
—Cater, Getta M., Muskegon, Mich.
Chamberlin, Henry Ward, La Crosse, Wis.
Chowning, William, Minneapolis.
Cleveland, Hiram Edward, Northfield.
Cohen, Harry Archibald, Minneapolis.
Cowles, Danforth Chaucer, Minneapolis.
Dart, Leslie O., Litchfield.
Davis, Luther Alvin, Bertram.
Day, Floyd McArthur, Preston.
Dickman, Lester Albert, Westgate.
Donovan, John Joseph, Minneapolis.
Doyle, John Willis, Minneapolis.
Eberlin, Edward August, Blue Earth City.
Eisengræber, Gustav Adolph, Jerichow, Germany.
Evans, Owen, LaCrosse, Wis.
Ewing, C. Francis. Angola, Ind.
Farmer, Sidney Stewart. Owatonna.
Farrish, Robert Cyrus, St. Paul.
Ferguson, James Corey, Olivia.
Fligman, Louis H., Helena, Mont.
Foster, Alson James, St. Paul.
Hanson, Martin O., Lemond.
Holst, Claude Frederick, Red Wing.
—Hopkins, Mary Parker, St. Paul.
Houston, Charles Alexander, Kasson.
Johnson, Herman M., Pelican Rapids.
Jones, Herbert William, Berlin, Wis.
Kiehle, Frederick Andrews, *B. A.*, M'p'l's.
Koren, Finn, *B, A.*, '98, Montevideo.
La Rose, Victor Joseph, St. Paul.
Lees, Robert Bruce, Minneapolis.
Levinson, Archibald Ezekiel, Minneapolis.
Loberg, Adolph Edward, Minneapolis.
Maloney, Thomas James, St. Paul.
McCloud, Charles Naumann, St. Paul.
McGuigan, Henry Thomas, Millville.
Mathisen, George B., Evansville.
Olsen, Sterling Herber, Austin.
Parker, Harvey Gamaliel, Waseca.
Prinzing, Jacob, St. Paul.
—Putnam, Catherine Eliza, St. Paul.
Rose, Frank, Minneapolis.
Sanford, James Alfred, Alderly, Wis.
Savage, Francis Joseph, Minneapolis.
Schneider, Henry A., Deerfield.
Stemsrud, Arne A., Madison.
Stierle, Adolph, Jr., St. Paul.
Stolpestad, Harold Lauritz, St. Paul.
Strout, George Elmer, Sebastapol, Cal.
Sweitzer, Samuel Edward, Minneapolis.
Truscott, Joseph Robert, Minneapolis.
—Vallely, Rose Viviana, Fairhaven.
Wells, H. Journeay, Minneapolis.
Whitacre, John Clifford, St. Paul.

THIRD YEAR, 73.

Alger, Edmund W., Minneapolis.
Arey, Hugh C., St. Paul.
—Barsness, Nellie O., Starbuck.
Baxter, Stephen H., Minneapolis.
Bennion, Percival H., Litchfield.
Bickford, Frank J , Maine.
Bissell, Frank S., Litchfield.
Bomberger, Franklin J., Minneapolis.
Brigham, Charles F., St. Cloud.
Brimhall, Silas J., San Diego, Cal.
Brown, Walter M., Minneapolis.
Brown, William G., Park River, N. D.
Budworth, Benjamin F., Minneapolis.
Bussen, Leonard H., Torah.
Cameron, John A., Hillsboro, N. D.
Clement, Lucian O., Waseca.
Coulter, Charles F., New York Mills.
Cummings, John H., St. Paul.
Davis, Frederick U., Mankato.
Donovan, John J., Minneapolis.
Drechsler, Herman A., Stillwater.
Eckman, Albert, Cokato.
Erb, Frederick A., Minneapolis.
Field, Merton, Bismark, N. D.
Fjelstad, Jacob C., Norway Lake.
Foster, Clyde C., Minneapolis.
Friedman. Aaron, Minneapolis.
Fulton, Thomas C , White Bear.
George, James W., Minneapolis.
Godfrey, Harvey B., Minneapolis.
—Goodman, Minerva, Minneapolis.
Guthrie, Charles E , Minneapolis.
Haugseth, Enoch, Minneapolis.
Heidekker, Arne A., Minneapolis.
—Hill, Elenor J., Minneapolis.
Iddings, Howard W., Grand Forks, N. D.
Ivers, Martin U., Minneapolis.
Jenson, J. Marius., Minneapolis.
Jenson, Charles A., Brighton.
Jewell, Emory L., Pine Island.
Johnson, William W., Bryson.
Judd, Edward S., Rochester.
Kittelson, Theodore, Canby,
Koch, John C., Fergus Falls.
Lamb, Harold, Sauk Center.
Larson, Frank E., Winthrop.
Lewis, William W., St. Paul.
Liedloff, Adolph G., Mankato.
Linneman, Nicholas J., Brainerd.
Lohrbauer, Ejner, Northwood N. D.
McCreery, Charles R., Northfield.
McCreery, William B., Northfield.
McDonald, Irving C., Buxton, N. D.
Meyerding, Edward A., St. Paul.
Millett, Josiah L., Graceville.
Norred, William A., Minneapolis.
Olson, Olof A., Dassel.
O'Malley, William P.,
Peabody, Percy D., Webster, S. D.
Peck, Lewellington D., Rochester.
—Ryan, Margaret, Minneapolis.
Schmidt, Walter R., Rochester.
Seashore, David E., Pilot Mound, Ia.
Seashore, Gilbert, Pilot Mound, Ia.
Shaleen, Arthur W., Lindstrom.
Stewart, Malcolm A., Flora, N. D.
Tanner, Andrew F., Minneapolis.
Thelen, William P., Stillwater.
Thoraldsen, Thorfin, Minneapolis.
Vinje, Syver, Dalton.
Vistaunet, Peter L., Fargo, N. D.
Wilcox, Van H., Spokane, Wash.
Wolner, Oscar H., St. Paul.

SECOND YEAR, 91.

Anderson, William S., Houston.
Axilrod, David L., Cumberland, Wis.
Baillee, William F., Barnesville.
Bevans, Theodore F., St. Paul.
Bockman, Michael, Minneapolis.
Bordwell, Frederick A., Stillwater.
Braasch, William F., Minneapolis.
Butler, John Jr., Minneapolis.
Call, Alfred M., Knox, N. D.
Campbell Eugene P., St. Paul.
Carpenter, Dwight J., Westfield, Wis.
Catlin, John J., Delano.
Chilton, Leo W., Fargo, N. D.
Churchill, James P., Minneapolis.
Clark, Robert, Elysian.
Clarkson, Paul G., Duluth.
Cook, Frederick, Prescott, Wis.
Coon, William F., Eau Claire, Wis.
Coulter, Herbert, Ioamosa, Cal.
Dahl, Jacob O., St. Paul.
Davis, Frank W., Taopi.
Deslauriers, August A., St. Paul.
Desmond, Michael A., Rushford.
Devine, John L., St. Paul.
Doe, Le Roy, Fargo, N. D.
Daugherty, Edwin B., Duluth.
Daugherty, Louis E., Duluth.
Dumas, Delbert F., Minneapolis.
Ellis, Burton,
Fitzgerald, Don F., Minneapolis.
Fowler, Paul H., Rochester.
French, Ernest A., Plainview.

—Fullerton, Ellen, Minneapolis.
Gray, Clyde, Minneapolis.
Green, Eugene K., Brooklin Center.
Hagaman, George K., No. St. Paul.
—Harden, Kate C., Minneapolis.
Hart, Alfred B., Minneapolis.
—Hebard, Sue, Mondovi, Wis.
Higgins, John H., Minneapolis.
Hovde, Anders G., Kenyon.
Hubbard, Frederick G., St. Paul.
Irvine, Harry G., Minneapolis.
Jelstrup, Christian B., Minneapolis.
Jensen, James C., Spring Grove.
Johnson, Anders E., Minneapolis.
Juliar, Richard O., St. Clair.
Kaess, Andrew J., New Ulm.
Klove, Lewis, Dunbar, Ia.
Lenfest, John W., Anoka.
—Lindstrom, Josephine, Oberon, N. D.
Lupton, Ernest A., Minneapolis.
Lyman, Fred V., Caledonia.
McClure, John H., St Paul.
McCullagh, George, Cobourg, Ont.
McDonnell, William N., Detroit.
Magnusson, Herman E., Stark.
Makinson, Herbert A., Cedarville.
Mee, Patrick, Gaylord.
Melby, Benedik, Merrillon, Wis.
Mueller, George F., La Crosse, Wis.
Munns, John F., Minneapolis.
Newgord, Julius G., Minneapolis.
Nicholson, Joseph, Strout.
Nickerson, Bernard S, Minneapolis.
Noth, Henry W., Minneapolis.
Old, Herbert W., St. Paul.
Pettit, Charles W., Preston.
Phelan, Richard J., Lake Mills, Ia.
Revell, Aris L., Minneapolis.
Rice, George D., Adrian.
Robitshek, Emil C., Minneapolis.
Rowe, Olin W., Benton Harbor, Mich.
Russell, Clarence W., Augusta, Wis.
Schacht, Frederick E, Elizabeth.
Schalaben, Henry O., Madelia.
Schneider, John P., Rollingstone.
Schuldt, Fred C., Lakefield.
Shellman, John L., Fergus Falls.
Smith, Carsten C., Decorah, Ia.
Staley, John C., Bismark, N. D.
Stephenson, Robert B., Minneapolis.
Sterner, Otto.
Stimpson, Edward W., Newport, Ore.
Tilderquist, David L., Vasa.
Todd, Gilbert D., Minneapolis.
Voges, Adolph, St. Paul.
Wethall, Anton G., Stoughton, Wis.
Whipple, Clarence O., Rochester.
Wiger, Nicholas, River Falls, Wis.
—Wilkinson, Stella L.

FIRST YEAR, 93.

Abbott, John G., St. Paul.
Abbott, W. Pitt, Faribault.
Amundson, Orin C., Estherville. Ia.
Anderson, Arnt Gruntvig, Minneapolis.
Anderson, Walmer, Minneapolis.
Bartlett, Clayton Elmer, Wykoft.
Bessesen, Wm. Aaron, (Special) Albert Lea
Biederman, Jacob (Special), Stillwater.
Bigelow, Chas. Edward, Dodge Center.
—Bird, Amy, Osakis.
Birnberg, Tobias, St. Paul.
Blais, Charles, Minneapolis.
Boeckmann, Egil, St. Paul.
Bohland, Ernest H., St. Paul.
Brand, Wm. Algernon, Big Stone City, S. D.
Buckbee, Chas. Everets, Minneapolis.
Campbell, Lorne Alexander, Waka, Ont.
Campbell, Robert Wilson, Tracy.
Coffin, Samuel David, Lyndale.
Coria, Leon, Minneapolis.
Costello, Thos. James, Graceville.
Crossette, George Dart, Minneapolis.
Dittman, George Claude, St. Paul.
Dix, George Edwin, Canby.
Drake, Chas. Ralph, Rushford.
Dunn, John T., Waseca.
Epley, Otis Hoyt, New Richmond, Wis.
Freeburg, Harry Milton, Charles City. Ia.
Freeman, Chas. Doney, St. Paul.
Frost, Wm. Stuart (Special), Willmar.
Gaard, Rasmus, Roland, Ia.
Gallagher, Patrick Joseph, Graceville.
Gallup, Glen Dean, Hudson, Wis.
Gates, C. Edson, Rochester.
Golseth, Gustave (Special), Ashby.
Gowenlock, Harry Joseph, Barnesville.
Graif, Alexander G, Lake Crystal.
Gronholm, John, Finland.
Gunz, Abe Nathan, Austin.
Hassman, Benjamin R., Hutchinson.
Higgins, Irving Wilbur, Hutchinson.
Hoffman, Walter Frederick, Minneapolis.
Hoffman, William Louis, Sioux Falls, S. D.
Humiston, Ray, Worthington.
Hutchinson, Henry John, High Rock, Lynn, Mass.

Hynes, John E., Winnebago City.
Ivetz, Martin, Cold Springs.
Johnson, Hans, Willmar.
Johnson, John A., Minneapolis.
Jones, Robert L., Forest Lake.
Jonsson, Gunlauger Frederick, Grand Forks, N. D.
Kearney, Percy F., Janesville, Wis.
Kelly, Thomas Colvin, Duluth.
Keyser, Howard, Minneapolis.
Kiefer, Michael A. (Special), Sleepy Eye.
Klemer, Carl Arthur, Faribault.
Knutson, Ole, Little Coff.
Koren, Harold, Minneapolis.
Kuth, Joseph Robert, Minneapolis.
Kvello, Olof A., Lisbon, N. D.
Kvittum, Joseph Marcus.
—Lambert, Marion, Minneapolis.
Larsen, Oscar O., New Centreville, Wis.
Lebowsky, Joseph A., Minneapolis.
Liedloff, Wm. Ferdinand, Mankato.
Lundmark, Lambert, Cumberland, Wis.
—McCabe, Otta, Minneapolis.
McKibben, Harry E.
Mattson, John Albert, Dassell.
Maurer, Edward L., St. Paul.
Newton, Alexander B., Jr.
Nyquist, Jacob Erick, Hopkins.
Olson, George, Minneapolis.
Pratt, Burton Atwood, Minneapolis.
Pratt, Chelsea Carroll.
Preisinger, Jos. Wolfgang, New Ulm.
Quale, Cart C., Sunburgh.
Ramaley, Louis, (Special), St. Paul.
Ransom, Edward Madison, Minneapolis.
Reynolds, Jas. S., New Hampton, Ia.
Ribble, George R. (Special), St. Peter.
Robbins, Ray Palmer, Sauk Center.
—Robertson, Allis, Wadena.
Rosen, Samuel, Minneapolis.
Ross, Levi G.. Janesville, Wis.
Scherer, Carl A., New Ulm.
Schulze, Albert Gustav, Duluth.
Stebbens, Eugene, Barron, Wis.
Tebbitt, Robert Lancelot, Estherville, Ia.
Thomson, Arthur, Minneapolis.
Wallace, Charles, Jas., Iola, Wis.
Webster, Albert Martin, Minneapolis.
Wheeler, Frederick L. (Special), Minneapolis

COLLEGE OF HOMEOPATHIC MEDICINE AND SURGERY.

FOURTH YEAR CLASS—4.

Bickford, Harley Gray, Maine.
Mitchell, Roy Ernest, Porter Mills. Wis.
Sutton, Harry Everett, Minneapolis.
Tunstead, Hugh John, Minneapolis.

THIRD YEAR CLASS—6.

Haegerty, William B., M. D., *University of Edinburgh*, Minneapolis.
Hall, Earl Lester, Eau Claire, Wis.
Rogers, Frederick Drake, St. Paul,
Smith, Norman Marshall, Monticello, Ia.
Wallace, Paul Bartlett, Minneapolis.
Warner, Eugene Frederick, St. Paul.

SECOND YEAR CLASS—8

Dawson, Charles Arthur, Minneapolis.
Holmes, Charles Franklin, Aberdeen, S.D.
Newkirk, Harris Dana, B.S., Minneap'l's.
Page, George Edgar, B. S., Anoka.
Pond, Irving Judson, Minneapolis.
Riley, Percy E., Eau Claire, Wis.
Schmidt, Gottfried, B. S., St. Paul.
Whittemore, J. Gooch, Glenwood.

FIRST YEAR CLASS—8

Ballard, James Allen, St. Paul.
—Libby, Helen L., Minneapolis.
—MacKeen, Ida H., Minneapolis.
Moore, Orin Thomas, Slayton.
Olander, Edwin E., A. B., *Augustana U.*, Rock Island, Ill.
Vermilyea, Earl, Dexter.
Wilkowski, Conrad W., Morristown.
Williams, Stephen E., River Falls, Wis.

SPECIAL, 1.

Cole, Carl Vincent. Fergus Falls.

COLLEGE OF DENTISTRY.

THIRD YEAR, 37.

Ball, William Harrison, Morgan.
Billings, Wall Marion, *B. S.*, '98, Minneap's.
Brodeen, Albin, Minneapolis.
Brownlee, Wilber James, Fisher.

Child, Harry Burr, Minneapolis.
Cox, Norman J., *B. S.*, '98, Wasioja.
Creelman, Ernest Everett, Parker's Lake.
Dahlgren, Bror Eric, Gothenburg, Sweden.
Doheny, Edward James, Green Isle.
Fletcher, Freeman Fowler, Red Lake Falls.
Frodeen, Henry Emmanuel, Minneapolis.
Holmberg, John Lewis, St. Peter.
Holmgren, Carl Johan, Minneapolis.
Jaehning, Herman Schmall, New Richmond.
Jargo, Adam Boorman, Luverne.
Johnson, Martin Calvin, Minneapolis.
Kennedy, John Duncan, Tracy.
McNerthney, Michael James, Red Lake Falls.
Moody, Adolph, Minneapolis.
Nelson, Orrin Chauncey, Manannah.
Olson, Adolph, Minneapolis.
Osterberg, Alfred, Stockholm.
Owens, John Evans, Sleepy Eye.
Palmer, Ralph George, LeRoy.
Pepper, Frederick William, Minneapolis
Peregrine, Harry Granger, Winona.
Rhame, Walter Stevens, Minneapolis.
Sargent, Will Ernest, Lowell, Mass.
Smith, Ai Biley, Minneapolis.
Stoudt, Frank Lawrence, Hastings.
Sweet, Cyril Fairman, Mankato.
Thiebaud, James Earl, Minneapolis.
Thompson, Thomas L., Peterson.
Thorsen, Adolph Theodore, New Centreville, Wis.
Woehler, William Winfred, Waubay, S. D.
Works, William Joseph, Hawley.
Yates, Cecil Fred, New Ulm.

SECOND YEAR, 38.

Allen, Arthur Barrett, Grafton, Ill.
Alther, Arthur Eugene, Minneapolis.
Amundson, LaDue, Estherville, Ia.
Bacon, Dexter Sterling, Cannon Falls.
Bathrick, Chester Aubrey, Rushford.
Beede, Thad S., Northfield.
Bettschen, Wm, Farnsworth, Berlin.
Brown. James Scott, Theilman.
Caine. Wm. Allen, Minneapolis.
Carter, Cyrus Joseph, Minneapolis.
Crandall, Charles Ray, Etter.
Fish, Lawrence James, Minneapolis.
Foster, Albert Ray, Minneapolis.
Gunderson, Julius Lavine, Kenyon.
Hickman, Carl Edward, Minneapolis.
Jorgens, Carl Sophus, Minneapolis.
Kaliher, Eugene Wm., Lake Fremont.
Lafans. Walter Scott, Minneapolis.
Lindsley, Wm. Sherman, Makato.
Meyer, Fred Sophus, Minneapolis.
Miller, Daniel Ralph, Duluth.
Moorhouse, Franklin Elmer, Minneapolis.
Moran, Michael, Mantorville.
Oberg, Alfred Tion, St. Paul.
Palmer, Walter Norman, Lisbon, N. D.
Peterson, Plymouth Oscar, Minneapolis.
Russell, Aubrey Herbert, Anoka.
Sandy. Benj. Arthur, Minneapolis.
Schacht, John, Minneapolis.
Seaquist, Wm. Peter, Mankato.
Smith George Dwight, Minneapolis.
Tifft, J. Floyd, Hutchinson.
Tuck, Lewis Edward, Minneapolis.
Turner, Edward Warden, Minneapolis.
Trondson, Alex, Samuel, Black River Falls, Wis.
Vanstrum, Albin R., Minneapolis.
Waddell. Loren Burton, West Mitchell, Ia.
Wanous, Edwin Frank, Glencoe.

FIRST YEAR, 31.

Ahlstrom, Joseph Theodore, St. Peter.
Bosel, Albert Christian, Henderson.
Burns, Jay Hugh, Stewart.
Cain, James Robert, West Concord.
Clemmer, John J., Minneapolis.
Cole, Claude Lynn, Fergus Falls.
Conley, Samuel Lewis, Cannon Falls.
Cook, Michael Francis, Faribault.
Crane, Emory Saxe, Minneapolis.
Davies, Norman Llewelyn, Minneapolis.
Day. Judson Leroy, Clinton Falls.
Frankoviz, Frank Anton, Fergus Falls.
Goodspeed, Henry Irwin, Waseca.
Hagaman, Clarence Augustus, No. St. Paul.
Hektner, Hans Christian, Mooreton, N. D.
Huestis, Walter Clyde, Minneapolis.
Hull, Isaac Stephenson, St. Paul.
Kuncke. Gustavus Adolphus, Henderson.
Lasby, Wm. Frederick, Northfield.
Olsen, Ambrose Burtis, Minneapolis.
Pattison, George Jay., Herman.
Peterson. Ernest Francis, Minneapolis.
Pike, Jay Nelson, Lake City.
Prendergast, Frank, St. Paul.
Spring. William J., Madison.
Sparrow, Cecil Chester, Ortonville.
Trench, James Francis, Dennison.
Werring, Oscar Sidney, Sleepy Eye.
Whitcomb, Harold Warren, Rollis.
Williams, George Davis, Willmar.
Yaeger, Frederick Spencer, Helena, Mont.

THE COLLEGE OF PHARMACY, 70.

GRADUATE STUDENT, 1.

Bachman, Gustav, Avoca.

SENIOR CLASS, 29.

Bock, Rolland, St. Paul.
Bollman, Frank Frederick, Harmony.
—Camden, May Estella, St. Paul.
Chernausek, William, Hutchinson.
Clarke, Guy C., Augusta, Wis.
Cleveland, Zina R., Northfield.
Elick, D'Roy Rayme, Minneapolis.
Fuller, Paul Clifford, Rochester.
—Greer, Eva Emily, Menominee, Wis.
Hurley, William. Pine City.
Jewell, Scott W., Pine Island.
Johnson, Nelius Julian, Mabel.
Kiesling, Emil Charles, New Ulm.
Landeen, Arthur Ferdinand, Garfield.
—Leidal, Nellie, Fergus Falls.
Milne. Henry John, Canton, S. D.
—Mober, Nellie Virginia, Minneapolis.
Negaard, George E., Norway Lake.
Neumann, William Henry, Leurston.
Nielsen, Max Nels, Minneapolis.
O'Connell, Charles John, New Rockford, S. D.
Peterson, Harvie Orie, Colfax, N. D.
Porter, Oliver Milton, Willmar.
Rodgers, Robert Fairbairn, Farmington.
Rutherford, Charles Franklin, Stillwater.
Scarf, Henry, Pipestone.
Stadon, J. Harry, Minneapolis.
Stewart, Edwin Francis, Wykoff.
Whittemore, Lee Arden, Elk River.

JUNIOR CLASS, 38.

Anderson, Carl John Oscar, Kerkhoven.
—Aubrecht, Anna Francrs, Minneapolis.
Britzius, Wesley Adam, Rochester.
—Campbell, Lulu, Minneapolis.
Davis, George C., Minneapolis.
—Dolenty, Emma C., Minneapolis.
Dreis, Walter Frank, St. Paul.
Erkel, Arthur George, LeSueur Center.
Fuller, Paul Clifford, Rochester.
—Harr, Cecile Inez, Belmond, Ia.
Hawley, Herbert Charles, Walhalla, N. D.
Holmberg, Harry DeWitt, Faribault.
Irwin, George Wilson, Minneapolis.
Jamieson, Roy R., Drayton, N. D,
Johnson, Henry O., Sacred Heart.
Kellam. Alex S., Heron Lake.
Kregel, William C , Minneapolis.
Kuhn, Arthur, Red Wing.
McCormick, Leslie J., Tracy.
McDaniels, Frank, Minneapolis.
Milne, George W., Minneapolis.
Morse, Herbert N., Minneapolis.
Netzer, Edward Franklin, Crookston.
Penney, Frank Walter, Minneapolis.
—Provost, Delphine, Big Timber, Mont.
Rood, Adolph Ferdinand, Minneapolis.
—Rubeck, Belle, Elk River.
Schouten, Charles P. Lisbon, N. D.
Thorpe, Clarence McKenzie, Hancock.
Tierney; Michael Joseph, Henderson.
Tilson, Frank H., Duluth.
Torgerson, Thomas, Sombre, Ia.
Vaughn, Patrick Henry, Morris.
Warren, Edwin Ferris, Little Falls.
Weibler, Peter Hubert, Belle Plaine.
Wiley. Ross Arthur, Tracy.
Williams, Floyd S., Minneapolis.
Zander, Charles H., Rochester.

UNCLASSED STUDENTS, 2.

Gassoway, Walter F., Minneapolis.
—Williams, Evelyn, Minneapolis.

SUMMER SCHOOL, UNIVERSITY SECTION, 361.

Ackerman, Adolphus, New Ulm.
Ackerson, Williard H., Minneapolis.
Adams, Arthur T., Minneapolis.
Adams, Emroy C., Minneapolis.
Adley, LaFayette R., Perham.
Ahnfeldt, Alfred Nelson, Minneapolis.
Alexander, Ida Mary, Carver.
Alexander. Theo Sophia, Carver.
Alger, Edmund Whitney, Minneapolis.
Allen, Olive Maude, Minneapolis.
Amonson, Nettie, Minneapolis.
Andrews, Adolph Peterson, Minneapolis.
Arndt, Caroline Agnes, Minneapolis.
Arnold, Rose Matilda, Brainerd.
Austin, Bertha Bowen, Oakland.
Austin, Loyd Barrick, Oakland.
Avery, Bertha C., Minneapolis.
Avery, Lillian, New Paynesville.

Ayres, Mary Frances, Minneapolis.
Bailey, Campbell L., Minneapolis.
Baker, Clyde C., Sherburn.
Baker, Helen May, Brownton.
Barteau, Fred, Pine Island.
Bartleson, Mabel, Minneapolis.
Bartleson, Maude, Minneapolis.
Bartlett, Laura J., St. Paul.
Beaumann, Julia Mary, Faribault.
Berg, Theo E., Merriam Park,
Bernhagen, John Fred, Minneapolis.
Blitz, Annie Dudley, Minneapolis.
Blondel, Blanche G.. Duluth.
Boal, Agnes Nanie, Faribault.
Bodien, Victor, Minneapolis.
Borrensen, Lilly Mary Elizabeth, La Crosse, Wis.
Boucher, Nettalie, Minneapolis.
Boyson, Christine Holmes, Camden Place.
Brace, Bessie, Minneapolis.
Bradley, Belle, Minneapolis.
Brainerd, Mrs. Elizabeth, Albert Lea.
Bramhall, Mrs. Frances, St. Paul.
Brekken. John L., Brechenridge.
Briggs, Jennie May, Minneapolis,
Brown, Eliza Kay, Minneapolis.
Brown, Harriette Stuart, Minneapolis.
Brown, Lizzie C., Minneapolis.
Buckley, Nellie A., St. Paul
Buell, Mary Emma, Minneapolis.
Buer, James, Faribault.
Burbridge, Helen Pauline, Minneapolis.
Burch, Miriam A., Excelsior.
Burkhard, Oscar Carl, Preston.
Burnett, Ida A., Everdell.
Byrnes, Mary Russell, Minneapolis,
Camp, Helen Elizabeth, Minneapolis.
Campbell, Effie May, Minneapolis.
Cantieny, Florence V., Minneapolis.
Carson, Frank, Minneapolis.
Carter, Alice Ellen, Minneapolis.
Cashman, Mary Eleanor, Owatonna.
Cashman, Sadie, Owatonna.
Chapman. Margaret E., Rush City.
Chase, Lillian, Anoka.
Chedeck, Benjamin Harry, Minneapolis.
Chelgren, Emil O., Cokato.
Clark, Ellen C., St. Louis, Mo.
Clark, Florence Alida, Carver.
Clinch, Anthony Barclay, Dayton.
Clinch, Lizzie Harriet, St. Paul.
Clinch, William C., Northcote.
Constance, Molly, Hopkins.
Cook, Bella A,, Minneapolis.
Cornish, Bonetta, Myrna.
Corson, Emily Harris, Minneapolis.
Couper, Chlora Ella, Minneapolis.
Coxe, Jesse E., Thompson.
Craig, Bird, Orrock.
Craig, Margaret Bell, St. Paul.
Cross, Clara Amelia, Minneapolis.
Crowley, Mary Katharine, Dickinson, N. D.
Dankwardt, Joachim M., Lake City.
Damm, Zelma, Minneapolis.
Davison, Robert L., St. Louis Park.
Davison, Joseph Henry, Minneapolis.
Deering, William C., Minneapolis.
DeLamere, Elizabeth Eleanor, St. Paul.
Dempsey, C. Rose, Minneapolis.
Dennison, Florence M., Minneapolis.
Denny, Grace E., St. Paul.
Derickson, Maude E., Minneapolis.
Doherty, Anne, St. Paul.
Doherty, Walter Anthony, St. Paul.
Dorn, Helena, St. Paul.
Donoline, Blanche, Clear Lake, Ia.
Dresser, Medora Estelle, Minneapolis.
Duff, Dardania D., St. Paul.
Dunphy, Angela, Duluth.
Eaton, Benjamin Galen, Merriam Park.
Eaton, Eleanor Bradley, Minneapolis.
Ecklund, Edward Edford, Minneapolis.
Eggen, Halsten O., St. Peter.
Elberg, Elfrida Louise, Minneapolis.
Elliott, Mrs. Savylla, Morris.
Elskamp, Leo. Minneapolis.
Evans, Mary Sophronia, Minneapolis.
Fairchild, Carolina Friend, St. Paul.
Falvey, Nellie, St. Paul.
Fanning, Mary Gillmore, St. Paul.
Farrow, Alida B., Eldora, Ia.
Flynn, Mary Blanche, Morris.
Force, Frank Eugene, Minneapolis.
Forsyth, Olga B., Minneapolis.
Foss, Bertha Gureine, Minneapolis.
Foulke, Edith, St. Paul.
Fowler, Alice Josephine, Minneapolis.
Franzen, Herman Gustave, Minneapolis.
Frederickson, William Dankert, Ulen.
Fryckberg, John W. St. Paul.
Fuller, Milton Pickett, Albert Lea.
Gallagher, Kathryna Agnes, Anoka.
Gallagher, Richard, Minneapolis.
Garbett, Louise, Minneapolis.
Gartland, Jennie M., Esmond, S. D.
Geraghty, Thomas P., St. Paul.
Gibbs, Edna B., Long Prairie.
Gillette, George Lewis, Minneapolis.
Gillette, Ralph P., Minneapolis.
Glover, Daza, Minneapolis.
Graves, Ethel S., St. Paul.
Griffin, Isabella E., White Bear.
Grinsted, Grace Ann, Minneapolis.
Groat, Benjamin F., Minneapolis.

Halvorson, Olaf, Minneapolis.
Harlow, Myrta Ellen, Albia, Ia.
Harty, Margaret. Berlin, Wis.
Harrington, Josephine M.. Minneapolis.
Harris, Ellis Nathan Minneapolis.
Harvey, Ellen D., Howard, S. D.
Hatch, Elizabeth, Pickwick.
Hawes, Harriet Maria, Minneapolis.
Hawk, Ella M., Minneapolis.
Hayes, Annie Marie, Minneapolis.
Hayes, Bridget Theresa, Minneapolis.
Hayes, Effie M., Minneapolis.
Hayes, Helen Marian, Minneapolis.
Heath, Elbridge L., Faribault.
Heitkamp, Irene Henrietta, St. Paul.
Helm, Morton C., South St. Paul.
Heneghan, Anna E., Rochester.
Hennessey, Denis Lawrence, Boardman. Wis.
Henry, Belle, Grover.
Hernel, Daisy, Minneapolis.
Herrick, Mary Laura, Minneapolis.
Hildrup, Helen L., Huntley, Ill.
Hoefling, Elfa C., Fergus Falls.
Holt, Charles Mead, Minneapolis.
Holt, Daisy Emma, Minneapolis.
Hosmer, Alice M., St. Paul.
Hubbard, Walter Raymond, Minneapolis.
Huff, Edna Greene, Fergus Falls.
Hult, Florence Bowen, Oakland.
Humphrey, Harry B., St. James.
Hurd, Burton L., St. Paul.
Hutchinson, Harriett Janc, Minneapolis.
Hutchinson, Ruth S., Minneapolis.
Hyland, Julia, Worthington.
Ireland, Roy R., Minneapolis.
Jacobson, Katherine, St. Paul.
Jefferson, Edna, Bingham Lake.
Jenkins, Frederick Edwards, Faribault.
Jennings, Jane Bue, Nashville, Tenn.
Johnson, Anna Carolyn, Minneapolis.
Johnson, Effie Matilda, St. Peter.
Johnson, Herman, Minneapolis.
Johnson, Marie Augusta, Minneapolis.
Johnson, Minnie, Minneapolis.
Johnson, Morton Lewis, Minneapolis.
Johnson, Emily, Minneapolis.
Jones, Elizabeth Marie, Minneapolis.
Jones, Mrs. Fannie Porter, Minneapolis.
Jones, Kirby, Duluth.
Joubert, Frederick Francis, Breckenridge.
Jungck, Emma, Menomonie, Wis.
Kammarren, Abbie M., De Pere, Wis.
Kelsey, Grace L., Merriam Park.
Kelsey, Maud May, Minneapolis.
Kendall, Jennie, Le Sueur Center.
Kennedy, Helen M., St. Paul.
Kennedy, Ida Belle, Minneapolls.
Kimball, Elizabeth M., St. Paul.
Kipp, Alice, Medford.
Kirby, Alice M., St. Paul.
Knowles, Marietta Loughridge, Ottawa, O.
Koch, Gesena Wilhelmina, Minneapolis.
Lange, Mary R., Redwood Falls.
Langlois, Alice, Minneapolis.
Lehman, Albert, Wadena.
Leiter, Lulu, Winthrop.
Lende, Olai A. Cottonwood.
Leonard. Mildred I., Menominee, Mich.
Lillie, Annie Laura, Minneapolis.
Lilley, Elizabeth, Minneapolis.
Lillie, Minnie Ermina, Minneapolis.
Lindquist, Ida Pauline, Minneapolis.
Linwell, Selma L., Minneapolis.
Litowitz, Lena, Minneapolis.
Livermore, Kate L., St. Paul.
Livingston, Laura Evelyn, Farmington
Long. Rhoda B., Minneapolis.
Lothrop, Mary Olive, Zumbrota.
McAdam, Margaret, Blooming Prairie.
McCarthy, William George, Faribault.
McCormick. Gertrude, Excelsior.
McDonald, Flora, Grafton, N. D.
McEachran, Duncan. Minneapolis.
McFeely, Madeline Sara, Minneapolis.
McGillis, Annie, Minneapolis.
McHerron, Minnie Katherine, Minneapoiis
McKaig, Gertrude, Hamline.
McKenzie, Donald, Minneapolis.
McKeon, Howard, Howard, S. D.
McKittrick, Elizabeth, Minneapolis.
Madison, Eliza Gertrude, Lansing, Mich,
Martin, Sophia Hoyt, Minneapolis.
Mase, George Anson, Minneapolis.
Massee, Will W., River Falls, Wis.
Mayne, Hugh William, Hecfor.
Miller, Frederick Casper, St. Paul.
Mitchell, D. A., Duluth.
Mitchell, Edwin Monroe, Northwood, Ia.
Mitchell, Helen E., Minneapolis.
Monette, Jeanette, Chatfield.
Moody, Helen Augusta, Minneapolis.
Moers, Alida E. Rockford.
Moore, Pauline, Montrose.
Moore, Vinne, Big Lake.
Morgan, Jessie T., New York.
Morgan, Oregon F., Elysian.
Morrill, Forrest A,, Randolph.
Meudeking, Galena, Minneapolis.
Mueller, Charlotte, St. Paul.
Mueller, Lena, St. Paul.
Nash, Anna Marie, Minneapolis.
Nash. Julia Agnes, Minneapolis.
Neesh, Sadie Grace, Cutler.
Newcomb, Lula May, St. Paul.

Nickell, Rose E., Omaha, Neb.
Niven, Agnes M., Minneapolis.
Newbury, Charles L., Ely.
O'Brien, Frances Marie, St. Paul.
O'Gordon, Hannah, Sacred Heart.
Ogren, John William, Minneapolis.
Ohr, Florence, St. Paul.
Ohr. Frances D., St. Paul.
Ohslund, Joseph Mamitz, Mahoo, Neb.
Olsen, Sigrud, St. Ansgar, Ia.
Olson, Adolph, Hopkins.
Olstad, Clara M., Minneapolis.
O'Neil, Gertrude M., St. Paul.
Owen, Gwen Pearl, Minneapolis.
Page, Grace Muriel, Minneapolis,
Parish, Helen, Sandstone.
Parker, Louise W., Minneapolis.
Parker, Mary Adiline, Minneapolis.
Peabody, Eleanor Butlar, Star Prairie, Wis
Peabody. Eunice D., St. Paul.
Peabody, Helen S,, Sioux Falls, S. D.
Peabody, Mary Arown, Sioux Falls, S. D.
Peck, Edith Laura, Minneapolis.
Penny, Edith May, Minneapolis.
Perry, Florence McCloud, St. Paul,
Peterson, Sophia, Princeton.
Pierce, Cliford Vivian, St. Paul.
Pingry, Frank Richardson, Minneapolis.
Porter, Charles William, Frazee.
Poucher, Clarissa, Minneapolis.
Pratt, Prudence Emily, Minneapolis.
Putnam, Sara L., Minneapolis.
Ramaley, Francis, St. Paul.
Ransom, Stephen Walter, Dodge Center.
Ray, Jessie Fremont, Center Chain.
Reed, John Homer, Minneapolis.
Reimbold, Henrietta M., St. Paul.
Robb, Emma S., St. Paul.
Robbins, Fannie Elvira, Austin.
Robinson, Agnes L., Minneapolis.
Roche, Agnes M., Minneapolis.
Roed, Olaf, Hagan.
Rosok, Peter Adolf Marius, Minneapolis.
Rueth, Agnes T. E., St. Paul.
Rule, Lulu, St. Paul.
Sage, Charles W., Minneapolis.
Sampson, Angebell, Franklin.
Sardeson, Eva Rossing, Minneapolis.
Schrader, Herman, Minneapolis.
Scott, Mary A., Faribault.
Seymour, Mabel, Laird.
Sigvaldson, Sigurdur, Minneota.
Sister, M. Beanche, Winona.
Sister, Celestine, Duluth.
Sister, De Sales, St. Paul.
Sister, Digna, St. Joseph.
Sister, Eugenia, Waverly.
Sister, M., Gertrude, Winona.
Sister, Gonzaga, St Joseph.
Sister, Hyacinth, St. Paul.
Sister, Margaret, St. Paul.
Sister, M. Paula, Duluth
Skinner, John Whithworth, Minneapolis.
Smith, Lillian Mae., Minneapolis.
Smith, M. Kate, St. Paul.
Soderberg, Izida, Minneapolis.
Sommers, Clara, St. Paul.
Sornsen, Martha A., Minneapolis.
Sperry, Roy E., Willmar.
Starr, Augusta Mara. Minneapolis.
Stene, A. Edward, Ashby.
Stephens, Irene V., Minneapolis.
Stevens, F. H.. Minneapolis.
Stewart, Nellie M., Minneapolis.
Stingham, Lillian Ruth, Fergus Falls.
Stockill, M. Carlotta, St. Paul.
Struble, Clara, Minneapolis.
Sweeney, Kate G., Virginia.
Tallon, Mary, St. Paul.
Tandberg, John P, Northfield.
Taylor, Fred Joseph, St. Paul.
Tennison, Mary Frances, Monticello.
Thaxter, Edna, Minneapolis.
Thomson, Eva F., St. Paul.
Tierney, Charles Nicholas, Farmington.
Tigue, Francis Henry, Minneapolis.
Tillisch, Mary Agnes, Minneapolis.
Tofte, Albert A., Fisher.
Torrelle, Ellen, Minneapolis.
Truesdell, Hattie M., Minneapolis.
Updyke, Nina T., Minneapolis.
Urquhart, Jean Grant, Huron, S. D.
Warner, Bertha Louise, Minneapolis.
Washburn, Grace Emma, Minneapolis.
Wayne, Alta M. Minneapolis.
Webster, Julia Corinne, Minneapolis.
Weir, Mary Delia, Minneapolis.
Welles, Hattie Eliza, Minneapolis.
Werner, David Edward, St. Paul.
West, Ruth, Minneapolis.
Whalen, Anna, Minneapolis.
Wheaton, Maude Ester, Elk River.
Wheeler, Clara Kingswell, Fergus Falls.
Wheeler, Eva G., Minneapolis.
Whitman, Jessie Laura, St. Anthony Park.
Whitney, Florence Ballon, St. Paul.
Whittaker, M. Lotte, Minneapolis.
Wildes, Frank A., Mankato.
Williams, Friend L., Watertown.
Williams, Lotta Mae, Minneapolis.
Woodworth, Eva Wheeler, Minneapolis.
Woodworth, Ida Belle, Minneapolis.
Woodworth, Luella, Minneapolis.
Xavier, Karl, Minneapolis.
Yerxa, Elizabeth, Two Harbors.
Zehnter, Ruby Pauline, Minneapolis.

Summary of Students.

THE GRADUATE DEPARTMENT.

	Men	Women	Total
Candidates for the degree of doctor of philosophy	34	4	38
doctor of civil law	11		11
master of laws	10	1	11
master of arts	18	1	19
master of science	25	6	31
master of literature	9	9	18
Others doing graduate work	21	33	54
Total	128	54	182—182

THE COLLEGE OF SCIENCE, LITERATURE AND THE ARTS.

		Men	Women	Total
Senior class.	classical section	18	8	26
	scientific section	37	21	58
	literary section	14	33	47
	civic section	6	5	11—142
Junior class.	classical section	12	12	24
	scientific section	38	25	63
	literary section	10	52	62
	civic section	36	15	51—200
Sophomore class.	classical section	14	11	25
	scientific section	35	19	54
	literary section	11	57	68
	teachers' section	2	14	16
	civic section	47	36	83- 246
Freshman class.	classical section	12	13	25
	scientific section	57	41	98
	literary section	17	106	123
	civic section	79	47	126—372
Unclassed students		46	77	123—123
Total		491	592	1083-1083

SCHOOL OF CHEMISTRY.

	Men	Women	Total
Senior class	1		1
Junior class	4		4
Sophomore class	1		1
Freshman class	4		4
	10		10

THE COLLEGE OF ENGINEERING, AND THE MECHANIC ARTS.

		Men	Women	Total
Senior class.	civil engineering section	5		5
	mechanical engineering section	2		2
	electrical engineering section	8		8—15
Junior class.	civil engineering section	19		19
	mechanical engineering section	10		10
	electrical engineering section	14		14
	science and technology	3		3—46
Sophomore class.	civil engineering section	25		25
	mechanical engineering section	25		25
	electrical engineering section	19		19—69
Freshman class.	all sections	94	1	95—95
	art course	1	15	16—16
Unclassed students		22	2	24—24
Total		247	18	265—265

THE SCHOOL OF MINES.

	Men	Women	Total
Senior class	8		8
Junior class	15		15
Sophomore class	26		26
Freshman class	36		36
Unclassed students	1		1
Total	86		86—86

THE DEPARTMENT OF AGRICULTURE.

	Men	Women	Total
Senior class	4		4—4
Junior class	5		5—5
Sophomore class	4		4—4
Freshman class	12	2	14—14
The school of agriculture—graduate students	2	1	3
class A	52	11	63
class B	68	25	93
class C	126	34	160
preparatory class	50	18	68
the dairy school	99		99
unclassed students	30	1	31—417
Total	452	92	544—544

COLLEGE OF LAW.

	Men	Women	Total
Graduate class—for doctor of civil law	11		11
for master of laws	10	1	11
Senior class	116	3	119
Middle class	150		150
Junior class	168	4	172
Total	455	8	463—463

THE DEPARTMENT OF MEDICINE.

THE COLLEGE OF MEDICINE AND SURGERY.

	Men	Women	Total
Graduate students	7		7
Senior class	62	4	66
Junior class	69	4	73
Sophomore class	86	5	91
Freshman class	89	4	93
Total	313	17	330—330

THE COLLEGE OF HOMEOPATHIC MEDICINE AND SURGERY.

Senior class	4		4
Junior class	6		6
Sophomore class	8		8
Freshman class	6	2	8
Unclassed	1		7
Total	25	2	27—27

THE COLLEGE OF DENTISTRY.

Senior class	37		37
Junior class	38		38
Freshman class	31		31
Total	106		106—106

THE COLLEGE OF PHARMACY.

Graduate course	1		1
Senior class	25	4	29
Junior class	32	6	38
Unclassed	2		2
Total	60	10	70—70

SUMMER SCHOOL FOR TEACHERS.

University section	106	255	361

SUMMARY OF TOTALS.

	Men	Women	Total
Graduate students	128	54	182
The college of science, literature and the arts	491	592	1083
The college of engineering and the mechanic arts	247	18	265
The school of mines	86		86
The school of chemistry	10		10
Department of agriculture	452	92	544
The college of law	455	8	463
The department of medicine	504	29	533
The summer school—University section, less duplicates	86	204	290
Total	2459	997	3456
Duplicates	42	1	43
Total, excluding duplicates	2417	996	3413

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Appendix A.

CLASS OF '90 FELLOWSHIP, 1901-1902.

The class of 1890 offers a fellowship of $200 for the year 1901-1902, to be awarded at commencement, 1901, subject to the following conditions:

The fellowship will be awarded only to a graduate of at least one year's standing, who has already been engaged in graduate work either in residence or *in absentia*.

Applications should be addressed to the president of the University, and should be in his hands by May 10, 1901. Each applicant should state the major subject he wishes to pursue, and should file with his application one or more examples of his scientific work, or other evidence of his ability to carry on original investigations, such as an unfinished thesis, a list of works consulted on a particular subject, or notes of scientific experiments.

The fellow will be expected to remain in residence at the University during the academic year, and to prepare a thesis embodying the results of original investigation on some topic connected with his special field work. The fellow may or may not be a candidate for a degree, but the thesis must be of sufficient merit, in the opinion of the professor in charge of the major subject, to be accepted as a thesis for the degree of Doctor of Philosophy.

Payments will be made to the Fellow as follows: $50 November 1, 1901; $50 January 2, 1902; $50 March 1, 1902; $50 May 1, 1902, or as soon thereafter as thesis shall be approved. The Fellow will be under no obligation to repay any portion of the stipend to the Class of '90 Fellowship Fund.

In case no applicant should show evidence of marked ability, the President of the University is authorized to postpone the award of the Fellowship from time to time.

MAX WEST,
JESSIE NICOL HOYT,
W. E. WINSLOW,
Fellowship Committee of the Class of '90.

Appendix B.

AWARD OF PRIZES.

The Moses Marston Scholarship was awarded to Allen R. Benham.

The '89 Memorial Prize was awarded to John C. Knox for a thesis entitled "Transition in Pennsylyania from the Colony to the Commonwealth." Honorable mention was made of the theses submitted by Clara A. Cross, "The Treaty of Ghent," and by Cora E. Marlowe, "Monroe's Cabinet and the Pensacola Affair."

Gillette-Herzog Prizes. First Prize—To Fred G. Tracy and William L. Kinsell for a "Study of the Lighting of Trains."

Second Prize—To T. Lester Daniel for a thesis upon "Friction of Shaft Bearings."

Honorable Mention—(1) To Edward M. Grime for "Design for the Structural Steel for a Twelve Story Office Building." (2) To Charles C. Higgins for thesis upon an "Air Hoist." (3) To Paul Prendergast for thesis upon a "Traveler for Bridge Erection." (4) Frank E. Johnson for thesis upon "Distribution and Intensity of Illumination in a Room."

Meysenburg Prize. Mr. Meysenburg, who had made the offer of the prize to be known as the Meysenburg Prize, died early in the University year, but provision was made to make the offer good for the present year. The judges appointed to decide upon the merits of the orations submitted recommended that the prize be not awarded.

The Schurmier Prize was awarded to Arthur A. McBride for an essay upon "Woman's Position as an Employee."

The William Jennings Bryan Prize was not awarded.

The Albert Howard Scholarship was awarded to Lillian Cohen.

The Paige Prize was awarded to Arthur C. Anderson for a thesis upon "Bank Fidelity Bonds."

The College Court Prize was awarded to Frank G. Sasse, for an argument sustaining the affirmative of the following question: "When the Owner of Real Property Loses His Title to the Same by Adverse Possession of Another, May His Widow Hold an Interest in the Property After His Death?"

The Pillsbury Prizes for 1901: First Prize—Thomas D. Schall.

Second Prize—Raymond L. Dillman.

Third Prize—Olai A. Lende.

The Peavey Prizes: Debate—Sophomore team, Messrs. Drake, Ladd, Thelen, won.

Oratory—John A. Layne, a sophomore, won first place.

Appendix C.

COMMITTEES FOR THE YEAR 1901-1902.

COLLEGE OF SCIENCE, LITERATURE AND THE ARTS.

Graduate Studies and Degrees—Professors Brooks, Folwell, MacMillan, Benton, McClumpha.

Library—Professors Folwell, Frankforter, Burton, Carlson, Klaeber.

Enrollment—Professors Hutchinson, Anderson, Wilde.

Unclassed Students—Professors Pike, McVey, Nicholson.

Conditioned Students and Extra Work—Professors Sigerfoos, Zeleny, Wilkin.

Program—Professors Leavenworth, Sidener, McVey.

Summer School—Professors Hall, Sanford, Clark.

Athletics—Professors Jones, Nachtrieb, Burton.

Military Affairs—Professors Moore, Folwell, Nicholson.

Curriculum—Professors Woodbridge, Hall, Hutchinson, Clark, MacMillan, Moore, McDermott.

Gymnasium—Professors MacMillan, Leavenworth, Zeleny.

Accredited Schools—Professors West, Kiehle, Sanford.

Music—Professors Frankforter, Woodbridge, Schlenker.

Teachers' Certificate—Professors Kiehle, Sanford, White.

Minnesota Daily—Professors Anderson, Zeleny.

Debate and Oratory—Professors McVey, McDermott, Sanford, White.

THE COLLEGE OF ENGINEERING AND THE MECHANIC ARTS.

Library—Professors Smith, Constant, Shepardson.

Enrollment—Professors Constant, Haynes, Springer.

Unclassed Students—Professors Kirchner, Nicholson, Smith.

Conditioned Students—Professors Flather, Haynes, Kirchner, Shepardson.

Program—Professors Shepardson, Hoag, Smith.

Athletics—Professor Hoag.

Military Affairs—Professor Haynes.

Graduate Studies and Degrees—Professor Eddy.

Curriculum—Professors Eddy, Flather, Hoag, Jones, Shepardson.

Degrees—Professors Hoag, Flather, Shepardson.

Freshman Faculty—Professor Haynes, chairman.

Sophomore Faculty—Professor Kirchner, chairman.

Appendix D.

The Gilfillan Trust. The following generous offer has been accepted by the Board of Regents. At the meeting of the Board, in June, it is probable that regulations governing the administration of this trust will be adopted.

MINNEAPOLIS, Feb. 8th, 1901.

To the Board of Regents of the University of Minnesota—Gentlemen:

Your favorable consideration of the proposition hereinafter set forth in detail is hereby solicited:

Actuated by my own experience from early life, I have had in mind for some time the establishing of a fund in trust, the income from which might be used in aid of such deserving youths of our state as might be found struggling for an education beyond their own means of obtaining. As your board represents and is invested with the government of the chief educational institution of the state, it has occurred to me that you might with propriety be made the repository of such a trust and the agency for the suitable execution thereof, and the bestowal of the benefits to accrue therefrom. In case an enlargement of your powers is found to be necessary or desirable, that can be accomplished by enactment of the legislature now in session.

The fund proposed to be established will be for the present, the sum of fifty thousand dollars, to be conveyed to you by deed defining the purposes and conditions of the trust, the beneficiaries thereof and the basis upon which the benefactions shall be bestowed. The principal of such trust shall be designated "The Gilfillan Trust," and shall remain inviolate and kept invested in the same manner and by the same persons, or officers, as the permanent fund of the University, and so as to yield the best income therefrom.

The income of the said fund shall be subject to the use and disposal of the said Board of Regents for the educational purposes hereinbefore specified, either in the form of a gift or temporary loan as the said regents may deem best, the beneficiaries to be and to continue to be, within the following limitations, that is to say:

First—They must be youths of the state of Minnesota, without regard to sex.

Second—They must be and continue of unblemished moral character, and of temperate and industrious habits.

Third—They must be such as, by examination and trial, shall evince and maintain a taste, habit and aptitude for study.

Fourth—The aid herein provided may be bestowed upon students in any of the departments of the State University, or in schools preparatory thereto.

The foregoing provisions shall be strictly construed, and as to any student who shall fail to come, or shall cease to be, within the said conditions, as so construed, shall forfeit all claim to the benefits of such fund.

It will be seen that the spirit of this benefaction is to aid and encourage such as are worthy, susceptible and willing to help themselves; none other may share its benefits.

Deeming this the best gift in my power to the state in which my whole active life has been spent, and craving your early consideration and acceptance of the same, I remain, Sincerely yours,

J. B. GILFILLAN.

The H. W. Wilson Short Story Prize Contest. Mr. H. W. Wilson, proprietor of the University Book Store, has instituted a short story prize contest, by offering prizes aggregating $100, and divided into a first prize of $50, a second prize of $25, a third of $15 and a fourth of $10.

The stories for which the prizes are offered shall be not more than 4,000 words in length, nor less then 1,000 words, subjects based on University life will be given a preference, and the first stories to be handed in will, everything else considered, be favored.

The award will be made on Commencement Day at the same time that the other awards are made.

It is not unlikely that this prize contest will be made permanent, the contest to be known as the H. W. Wilson Short Story Prize Contest.

The Briggs Prize in Foundry Practice. For the encouragement of studies in foundry practice. Mr. O. P. Briggs, president of the Twin City Iron Works, offers $75 annually in two prizes which are to be accompanied by gold medals.

The competition is open to sophomores in the college of engineering, and the prize will be awarded for the best essay relative to the above subject.

The Dunwoody Prize. Mr. Wm. H. Dunwoody, president of the St. Anthony and Dakota Elevator Co., offers $100 to that student who shall earn the right to represent Minnesota in the Northern Orotorical League. This league is composed of the seven largest universities of the central states, viz: Minnesota, Iowa, Wisconsin and Michigan State Universities, and Oberlin, Chicago and Northwestern.

The Lowden Prize. Mr. Frank O. Lowden, of Chicago, offers as a prize to be competed for by the Northern Oratorical League, an endowment of $3,000, which will yield an annual income of about $175. A prize of $100 will be given to the winner of the first place, $50 to the orator who gets second place, and the remainder will be set aside each year for an interest fund to accummulate, and in time produce another endowment.

The Pillsbury Prize. Honorable John S. Pillsbury has given an additional $100 to be used for prizes in the department of rhetoric and elocution. Half of this sum was used this year for the Nebraska extemporary contest, and the other half for the debate between the two sections of the sophomore class.

The Peavey Prize. Mr. Frank H. Peavey, has provided for a cash prize of $75 for the members of the team winning the freshman-sophomore debate, and another prize of $25 to the student in the freshman or sophomore classes writing and delivering the best oration. Both prizes will be offered this year.

UNIVERSITY OF ILLINOIS-URBANA
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